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DOMINICAN REPUBLIC: THE SUPERIOR INSTITUTE OF AGRICULTURE
DEVELOPMENT OF A PRIVATE INSTITUTION
OF HIGHER AGRICULTURAL EDUCATION

A.I.D. PROJECT IMPACT EVALUATION NO. 67

by

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FOREWORD

The Center for Development Information and Evaluation (CDIE) is responsible for the Agency for International Development's (A.I.D.) project impact and program policy evaluations. The goal of the evaluation program is to inform the Agency's policymaking process and to improve project design, implementation, and evaluation. Through examinations of A.I.D. and other donor and recipient country experience and the preparation of special syntheses, CDIE provides a better understanding of the characteristics of development programs and lessons of what works and does not work in various settings.

Evaluations are concentrated in specific subject matter areas in which the Agency has made considerable investments through support of development projects. One of these areas is higher agricultural education. The Superior Institute of Agriculture (ISA) in the Dominican Republic is one of many

programs supported worldwide by A.I.D. The impact analysis contained herocuses on how Agency-funded project inputs and other factors have affected ISA's growth, evolution, and contribution to Dominican agricultural and rural development.

ISA is unusual in that it is a private institution with a concomitant unique origin and special operational constraints and opportunities. The approach to the impact analysis was to identify major factors that constrained or facilitated institutional development and productivity. It can be anticipated that many of these factors are common to other institution-building efforts in higher agricultural education and, therefore, will merit attention in future A.I.D.-funded attempts at institution building. This study was conducted from July through December 1986 and involved two field trips by the study team to the Dominican Republic (see Appendix A). A final evaluation report will synthesize results from this and other impact assessments of higher agricultural education projects and relate them to future policy and programming by the Agency.

W. Haven North
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PREFACE

The study team is extremely grateful to the many Dominicans who gave freely of their time and informed the team with openness, objectivity, and dispassion about the past and current activities and accomplishments of ISA. The team is hopeful that the results of this report can and will be used by ISA and its supporters for the Institute's benefit and, more generally, for that of the Dominican Republic.

SUMMARY

The Superior Institute of Agriculture (ISA) was established in 1962 by a development association (Santiago Development Association) representing a group of socially concerned community

leaders in Santiago city. Its founders intended that ISA would train public servants and private entrepreneurs and technicians who would contribute to agricultural modernization.

ISA originated as an agricultural high school. Subsequently, it was expanded to include an undergraduate degree program in agriculture through the Madre y Maestra Catholic University (UCMM) and a non-degree-granting specialized program in rural development administration. ISA recently gained autonomous university status, although it will continue to use teaching resources at UCMM.

ISA has had numerous important direct and indirect impacts on national agricultural and rural development. Most employers rank ISA's training as superior to that received by students in other agricultural training programs. Current and former faculty are vitally involved in national decision-making regarding agriculture and rural development, either indirectly through research or directly through their positions in the Government, and through consulting or participation in policy seminars, conferences, and workshops with leaders of Government agencies. ISA faculty have conducted innovative adaptive research on commodities such as white sorghum and African oil palm, which has led to important foreign exchange savings. They have also influenced Government policy on critical issues such as agrarian reform and reforestation through participation in the design and execution of rural development programs.

Several factors account for ISA's dynamic role in the agricultural economy. First, members of the Santiago Development Association have provided continuous, strong, and dynamic leadership in policy formulation, program innovation, and resource mobilization. Second, early inputs by Texas A&M University helped to establish a strong sense of mission within ISA that permeates the attitudes of contemporary administrators and faculty and is transmitted to students by example, doctrine, and highly disciplined, rigorous study programs. Third, ISA'S dependence on external funding has contributed to its responsiveness to societal needs. Fourth, the Dominican Secretariat of Agriculture, A.I.D., and other international donors have played an important role in fostering innovation through their financing of quality training for ISA's faculty and innovative programs that respond to felt needs of agencies and industries servicing agriculture. Finally, institutional commitment to a highly selective recruitment program has enabled ISA to turn out graduates of superior quality.

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Several factors have constrained, or are likely to constrain, ISA's current and future impact on the agricultural economy. First, the curriculum does not provide the level of applied and problem-solving learning experiences desired by ISA's students and faculty. Second, the institutional network that links ISA's training program with research and outreach is still incomplete. Third, the pressure to mobilize financial support from the Dominican private sector to compensate for possible contractions in donor and/or Dominican Government funding of ISA

programs may divert the Institute's attention from the small-farm sector. Finally, pressures to reduce or terminate ISA's vocational/technical program and to create more graduate programs may serve to decrease the Institute's impact in meeting the present shortage of lower and mid-level agricultural technicians.

Several important aspects of the ISA experience merit special attention because they may represent more generic facets of the institution-building process in higher agricultural education.

First, strong support linkages between a college and its primary bureaucratic constituency, as in the case between ISA and the Dominican Secretariat of Agriculture, are of crucial importance in ensuring that the college has access to a policy and institutional constituency that are supportive of its interests.

Second, donor agencies should follow their efforts in creating institutional capacity with project-specific funding designed to build linkages in research and outreach activities to the rural sector.

Third, the ISA case suggests that moderate levels of resource scarcity can serve to generate institutional entrepreneurship and innovation. To ensure continued institutional innovation, donor funding beyond that provided for the initial building of core institutional capacity should be categorical project and program grants awarded in response to college initiatives in addressing major societal problems.

Fourth, external funding should not serve to infringe on the basic institutional autonomy of the recipient. Autonomy may serve as a major source of potential institutional entrepreneurship in driving college instruction and research toward social relevancy.

Fifth, institutional autonomy needs to be coupled with direct forms of accountability in ensuring college responsiveness to societal needs. Institutional mentorship, as manifested in such bodies as the Santiago Development Association, can serve as an important mechanism in providing leadership and accountability in college instruction and research.

PROJECT DATA SHEET

Project Funds
Received

Project Number	Project Title	by ISAa Dates (US\$ thousands)	
No Number	Loan to Santiago Development Association for Building Construction and Equipment	1962-1965	500b Loan
AID/1a-268	Technical Assistance to the Secretariat of Agriculture	1965-1973	+250 Grant
SDR 517-T-027	Small Farmer Program I	1975-1976	+550 Loan
DR 517-T-027	Small Farmer Program II	1977-1978	+83 Loan
DR 517-0144	Energy Conservation and Resource Development - Energy Farm	1980-1987	+1,000 Loan
DR 517-0125	Rural Development Administration Center Ic	1981-1985	800 Grant
DR 517-0160	Agricultural Sector Training	1983-1990	+1,000 Loan
DR 517-0125	Rural Development Administration Center IIc	1985-1987	1,600 Grant

a Many of these projects were national in scope but allowed for ISA's participation and use of funds. The exact amount of funding allocated to ISA from these projects could not be determined, so the entries in this column represent estimates of the amount of money received by ISA from these projects.

b This loan was subsequently supplemented with a \$264,000 grant from A.I.D. for the same basic purposes.

c Provided support only to ISA.

GLOSSARY

ADESUR - Development Association of the South

A.I.D. - United States Agency for International Development

BAGRICOLA - Agricultural Bank of the Dominican Republic

CADER - Center for Rural Development Administration

CARCISA - Cibao Meats, Inc. (meat packing company)

CATASTRO - National Cadastral Survey

CATIE - Center for Tropical Agricultural Research and Training

CDE - Dominican Electricity Corporation

CEDOPEX - Dominican Center for Export Promotion

CENDA - Northern Agricultural Development Center

CESDA - Southern Agricultural Development Center

CIAT - International Center for Tropical Agriculture

CIES - Center for Economic and Food Research

CIMMYT - International Center for the Improvement of Maize and Wheat

CIMPA - Center for Research and Improved Animal Production

CIP - International Potato Center

CNA - National Agricultural Council

COENER - National Energy Policy Commission

DIA - Department of Agricultural Research

FAO - Food and Agriculture Organization

FCE - Educational Credit Foundation

FED - Dominican Educational Fund

FONDESA - Development Foundation (a development bank)

FORESTA - National Forest Service

FRUDOCA - Dominican Fruits, Inc. (fruit processing company)

IAD - Dominican Agrarian Reform Institute

ICRISAT - International Crop Research Institute for the Semiarid Tropics

IDIA - Dominican Agricultural Research Institute

IMF - International Monetary Fund

INCAE - Central American Institute for Business Administration

INDOTEC - Dominican Institute of Industrial Technology

INDRHI - Dominican Institute of Water Resources

INESPRE - Institute for Price Stabilization

ISA - Superior Institute of Agriculture

ISNAR - International Service for National Agricultural Research

IUC - Inter-University Committee

JAAC - Agricultural Council for Joint Ventures and Consulting

La Previsora - Home Savings and Loan Association

LASPAU - Latin American Scholarship Program of American Universities

OAS - Organization of American States

ONAPLAN - Dominican National Planning Office

OSU - Ohio State University

OUC - Office of University Coordination

Plan Sierra - Sierra Regional Rural Development Project

PPA I - Small Farmer Program I

PPA II - Small Farmer Program II

PROAPE - Small Enterprise Assistance Program

PROSEDOCA - Dominican Seed Processing Company, Inc.

SCAD - Center for Scientific Agricultural Development

SEA - Secretariat of Agriculture

SDA - Santiago Development Association

UASD - Autonomous University of Santo Domingo

UCE - Central University of the East

UCMM - Madre y Maestra Catholic University

UNICA - Association of Caribbean Universities and Research Institutes

UNPHU - Pedro Henriquez Urena University

USAID - United States Agency for International
Development Field Mission

UTESA - Santiago Technological University

MAP OF THE DOMINICAN REPUBLIC

1. PROJECT SETTING

Dominican agriculture produces for export as well as for local consumption. Agricultural products, along with minerals from the primary sector such as gold and ferro-nickel, are the major source of foreign exchange for the country. Major export crops are sugar, which is controlled largely by the State Sugar Council, coffee, cacao, tobacco, and beef. Major products for internal markets are rice, beans, fresh vegetables, groundnuts, and tubers.

As is true for most developing countries, food staples for internal consumption are produced primarily by small farmers, while export crops are produced by large commercial enterprises. Government agricultural support agencies are responsible for providing services to both sectors. The Agricultural Bank of the Dominican Republic (BAGRICOLA) is the major source for agricultural credit for both sectors, although private banks also lend to the commercial sector. The Institute for Price Stabilization (INESPRE) is responsible for setting support prices and for marketing a substantial proportion of the production from the small-farm sector. However, in recent years it has seldom had funds to pay cash on delivery. Hence, it typically purchases from intermediaries who purchase at the farm gate at prices well under the "official" support prices.

The Secretariat of Agriculture (SEA) has major responsibility for executing policy directives and for providing research, extension, and technical assistance inputs for the agricultural sector. It coordinates the activities of nine regional centers, which reflect distinct agroclimatic regions of the country. It has two major regional research and development centers: the Northern Agricultural Development Center (CENDA), located outside Santiago, and the Southern Agricultural Development Center (CESDA), located outside San Cristobal. These centers are dedicated almost exclusively to adaptive research, including service activities such as soil testing and seed quality control. They have established strong ties with the International Center for the Improvement of Maize and Wheat (CIMMYT), the International Center for Tropical Agriculture (CIAT), and the International Potato Center (CIP)--the major international agricultural research centers in the Western hemisphere.

The Dominican Republic is currently confronting a severe economic crisis. It instituted drastic austerity measures in reaction to severe external imbalances in the economy, foreign debt payment pressures, and substantial deficits of public enterprises. These measures increased inflation in the short run and depressed economic growth. Production of food staples, such as rice and beans, has declined as agricultural credit sources have been reduced and payment for agricultural commodities by Government agencies has been delayed.

Agriculture is a major industry in the republic, representing over 54 percent of the labor force and a major source of foreign exchange earnings. Per capita incomes in rural areas lag behind those in urban areas. A major reason for this is a highly skewed distribution of land ownership. In 1970, 62.7 percent of the land was owned by the largest 10 percent of owners, while only 1.8 percent was owned by the smallest 10 percent of owners (World Bank 1978). A high percentage of the large land holdings are in pasture. There are approximately 300,000 small farmers who cultivate about 30 percent of the land. They supply much of the internal market with food and fiber. The Dominican Government owns much of the remaining land. Its major use is for sugar cane production through the State Sugar Council. Other arable lands are being parceled out to small farmers through colonization and agrarian reform projects (Weil et al. 1973).

2. PROJECT DESCRIPTION: THE ORIGIN AND EVOLUTION OF ISA

The Superior Institute of Agriculture (ISA) is located west of Santiago at La Herradura in the northwest region of the Dominican Republic. Santiago is the commercial center of the Cibao Valley, which is commonly referred to as the breadbasket of the republic. ISA was initiated in 1962 by a group of prominent, civic-minded industrialists and professionals in Santiago city. This elite group incorporated themselves as the Santiago Development Association (SDA) in 1961. At this time the SDA and the Agency for International Development (A.I.D.) identified a lack of trained manpower as one of the critical constraints to agricultural development in the Dominican Republic (Hartzog 1962). In 1961, it was estimated that there were only 15 trained agronomists in the entire country. To address this constraint, A.I.D. encouraged the SDA to take the initiative in creating a model vocational/technical school for agriculture. Responding to this opportunity, representatives of the SDA solicited financial assistance from the Ford Foundation and from A.I.D. to initiate ISA.

In 1962, A.I.D. signed a tripartite agreement with the SDA and the Dominican Government. Under this agreement, A.I.D. agreed to loan US\$500,000 to the SDA for the construction of buildings for ISA{1}; the SDA agreed to find the land for ISA; and the Dominican Secretariat of Education, Fine Arts, and Culture agreed to pay teachers' salaries for the vocational

education program. Simultaneously, the Ford Foundation, employing long-term faculty advisers from Texas A&M University, committed itself to support technical assistance for the instructional program and to establish and provide technical assistance to the Center for Scientific Agricultural Development (SCAD), which was designed to promote adaptive agricultural research and extension. Ford Foundation support for SCAD ended in 1968 when Texas A&M's technical assistance contract to ISA terminated. The Food and Agriculture Organization (FAO) then agreed to finance the continued operation of SCAD.^{2} Additional expatriate technical assistance was contracted under this arrangement, and the research continued unabated until 1974, when the Center was given to the Dominican Government and became the Northern Agricultural Development Center (CENDA).

A.I.D. continued to support ISA indirectly through a major project with the Secretariat of Agriculture to increase food production in the country. This project included a contract with Texas A&M University (1965-1973). In addition to providing considerable technical assistance to the Secretariat, including several advisers to ISA, the project financed advanced training in the United States for 47 graduates and faculty from ISA. It was during this period that ISA started its current undergraduate degree program.

Indirect A.I.D. assistance to ISA continued throughout the 1970s through two small-farmer projects that were national in scope. These projects were designed to build a coordinated, national system that would strengthen and match agricultural training at four universities with the research and extension efforts of the Secretariat of Agriculture. Thus, the four agricultural schools were provided with continued staff training support and money to help cover costs for research, equipment, and other instruction-related expenses.

In 1980 the Kellogg Foundation provided seed monies to ISA to initiate the Center for Rural Development Administration (CADER). As part of ISA, and modeled after the Central American Institute for Business Administration (INCAE) in Nicaragua, this program was designed to offer intensive management courses to mid-career Government development managers. Much of the Kellogg funding was used for technical assistance, building construction, and advanced degree training in the United States. In 1981, A.I.D. provided a substantial grant to ISA to support the activities of CADER. This was further supplemented by another grant in 1986 which, in addition to directly supporting CADER's activities, helped establish an endowment that will represent a permanent support base for CADER.

In 1983, A.I.D. and the National Energy Policy Commission (COENER) of the Dominican Government initiated the Energy Conservation and Resource Development project. This project focuses on reducing Dominican dependence on imported petroleum and increasing the use of local energy sources. ISA is being funded to undertake pilot studies on appropriate tree species for energy purposes and the most efficient technologies for

converting wood to different energy uses.

In 1983, A.I.D. and the Dominican Government initiated the Agricultural Sector Training project, designed to strengthen agricultural teaching, research, and extension institutions. This project is assisting in the development of graduate programs at ISA and the other three agricultural schools of higher education. This effort includes an ambitious advanced degree training program in the United States.

In summary, the above series of projects, which span the full 20 years of ISA's existence, have served to assist ISA's leadership to greatly expand the Institute's experience and capacities in agricultural education, research, and outreach to the rural sector. The undergraduate program has a current enrollment of 314 students. The Institute has 44 full-time faculty members, of which 7 hold Ph.D. degrees and another 28 have M.S. degrees or their equivalent. The remainder of the faculty hold B.S.-level degrees and are used primarily as instructors in the vocational high school program.

{1} This was later supplemented with an additional US\$264,000 of grant funds to cover additional costs.

{2} By that time, its name had been changed to the Department of Agricultural Research (DIA).

3. DIRECT INDICATORS OF ISA'S IMPACT

3.1 Research

ISA has not developed a detailed long-range research plan, largely because of lack of stable funding for research. ISA depends largely on outside funding to support research, and its agenda is set in part by funding availability. Identification of research projects results from an interactive process between ISA directors and faculty, and national and international funding agencies. Members of ISA's board of directors facilitate the interface between ISA and funding sources.

Largely because of the precariousness of research funding, ISA's research program has been adaptive, focusing primarily on a series of different food and cash commodities and secondarily on nonagronomic topics. ISA has emphasized agricultural commodities because of the need to increase foreign exchange through import substitution and the export of agricultural commodities. Several major commodity research efforts by ISA are discussed below.

3.1.1 Tomatoes

Adaptive research on tomatoes was initiated by Texas A&M University advisers during ISA's first years. It was financed by the Ford Foundation and the private sector. Today, tomatoes are grown throughout the republic by large farmers, and by small farmers on land supervised by the Dominican Agrarian Reform Institute (IAD). The industry supplies a large internal market in addition to generating foreign exchange through exports.

3.1.2 Rice

Research on rice was also initiated by Texas A&M advisers, who introduced improved germ plasm to the country. Through funding from the Secretariat of Agriculture, ISA researchers introduced several varieties from CIAT from 1973 to 1975. Known today as ISA-21 and ISA-40, they are widely used by small and medium-size farmers, as well as large farmers. Because of their short life cycles and salt tolerance, their use has resulted in substantial yield increases.

3.1.3 African Oil Palm

Research on the African oil palm was initiated in response to a recognized need to reduce cooking oil imports. Funding has been provided by a private Dominican firm (MANICERA), A.I.D.'s Small Farmer Program II, and the Organization of American States (OAS). The OAS provided support for related tissue culture work. Large companies have initiated African oil palm plantations, which will soon begin to produce oil for local markets.

3.1.4 Energy-Related Farming

Research on wood production for fuel was initially promoted by ISA faculty and members of its directorate. It emerged from concern about the uncontrolled use of dry forests and resulting problems of natural resource degradation (see Appendix E). Funding was provided by A.I.D. through its Small Farmer Program II and by COENER. The project is still in the developmental stage. Plans are to disseminate research results systematically beginning in 1988 when trees on experimental plots have matured. It is anticipated that the project will generate major foreign exchange savings through fossil fuel substitution and will contribute to natural resource conservation and, indirectly, to the longevity of reservoirs and dams by reducing soil erosion.

3.1.5 White Sorghum

Sorghum research was initiated in 1977 in response to a perceived need to find adequate substitutes for imported wheat flour. Several ISA faculty worked with sorghum varieties brought from CIMMYT. This research complemented work at CESDA. The project was transferred to Molinos Dominicanos, which today uses

20-percent sorghum flour in its production of pastas. Over 35 million kilograms of white sorghum are produced each year in the republic, which represents an additional income of over RD\$1 million per year (1981 rate of exchange) for Dominican farmers.

3.1.6 Blue Mold Fungus

In 1979, an ISA faculty member documented the presence in the Dominican Republic of blue mold fungus, a fungus that had destroyed the tobacco industry in Cuba. From 1979 to 1982 ISA faculty worked with the Secretariat of Agriculture and with tobacco industries to further document its presence and to design a program for its elimination. Financing of this activity came primarily from ISA and from Dominican tobacco companies. Major beneficiaries have been small farmers, who are the major producers of tobacco. The republic has benefited by preserving this important source of foreign exchange through exports.

3.2 Public and Private Service

As is true for research, ISA lacks an independent, stable source of funding for public service activities. Therefore, these activities are also largely defined by the availability of funding. Several major activities are reviewed in this section. Plan Sierra and CADER are funded by the national Government and by international funding agencies.

3.2.1 Plan Sierra

Plan Sierra is one of the largest, best publicized rural development efforts in the republic (see Appendix D). It addresses two national rural development problems: rural poverty and natural resource degradation. The plan is being carried out in the steepplands not far from Santiago. ISA and the SDA, together with Madre y Maestra Catholic University (UCMM), heartily endorsed university participation because they viewed it as an opportunity for ISA to incorporate a social action program into its activities.

ISA helped prepare the plan guidelines, which included the participation of ISA and UCMM in teacher training, provision of health and social services, and baseline agro-socioeconomic and ecological research. Specific projects carried out under Plan Sierra have included reforestation, revitalization of coffee farms, and social services. ISA faculty researched new forest species and perennial crops, experimented with fuelwood alternatives, and tested forage grasses and agroforestry systems.

ISA's inputs were less than originally anticipated for several reasons. First, class schedules often conflicted with agronomic fieldwork associated with cropping cycles. Second, transportation to and from the Plan Sierra site was not provided. Third, ISA faculty were not fully rewarded by ISA's administration

for this activity. Fourth, ISA faculty are less familiar with steepland agronomic practices than they are with lowland agronomic practices.

3.2.2 Case Studies of the Center for Rural Development Administration

ISA's Center for Rural Development Administration (CADER) has completed many case studies related to national development problems and has organized several national and regional policy seminars and conferences based on their findings. These seminars and conferences have had a marked impact on agricultural and rural development policies, including those related to agrarian reform and coffee exports. An outcome of a conference on agrarian reform was that the Dominican Government revised its practices for remunerating productivity on collective land holdings to more closely conform to the relative productivity of individual farmers. An outcome of a conference on the export of coffee was a broadening of the base of companies that had access to the export market.

3.2.3 Peralta, Ltda.

ISA has an agreement with Peralta, Ltda., a company that exports pineapples, to grow pineapples on its university farm for sale to Peralta. This activity provides income for ISA and enables ISA students to learn about the production process and the export industry.

3.2.4 The Dominican Seed Processing Company

The Dominican Seed Processing Company, Inc. (PROSEDOCA), a major seed company in Santiago, was initiated by ISA. ISA has a contract to produce ISA-21 and ISA-40 rice seed, which it then sells to PROSEDOCA. PROSEDOCA, in turn, distributes it to rice producers in the region. This activity provides opportunities for students to observe and participate in the seed production and marketing processes.

3.2.5 Cibao Meats, Inc.

Cibao Meats, Inc. (CARCISA) is a meat packing company in the Santiago region. The decline in beef consumption in recent years has directly affected the export of beef by CARCISA. CARCISA has contracted with ISA to seek its assistance in determining how best to use its refrigeration facilities to store perishable foods that it will also process for the export market. ISA, through its food science group, provides this assistance.

3.2.6 Molinos Dominicanos

Molinos Dominicanos, which produces wheat flour for bread, has contracted with ISA to research the substitution of white sorghum flour for wheat flour. This research includes analyses of nutritional qualities of the sorghum flour and its acceptability to the Dominican consumer.

3.2.7 Other Consulting Services

ISA provides other consulting and technical assistance services to the private sector. Its faculty are available for this assistance through the Agricultural Council for Joint Ventures and Consulting. In recent months, ISA faculty have provided technical assistance to Dominican Fruits, Inc. (FRUDOCA) and to the Dominican Coffee Producers Association.

4. INDIRECT INDICATORS OF ISA'S IMPACT

4.1 Employment of ISA's Graduates

ISA's primary mission is undergraduate teaching. To date, ISA has graduated 539 students. The typical career path for ISA graduates begins with a job in the public sector. After gaining on-the-job experience, some of the graduates then move to the private sector. Until recently, ISA graduates have not had much difficulty gaining employment in the public sector. An increase in the number of institutions offering B.S. degrees or their equivalents in agriculture may change this career progression, because it implies a greater number of graduates competing for public sector jobs.

In interviews, employers stated that they consider specialized and fieldwork skills to be most important in the hiring of new employees. They rated ISA graduates superior in specialized skills and equal in fieldwork skills to graduates of other institutions of higher agricultural education. They rated ISA graduates equal to those of other institutions in research and laboratory skills and scientific knowledge, but worse in general training skills. ISA graduates with previous vocational agricultural training were generally rated better than those without the previous practical training.

4.2 Publications by ISA's Graduates

ISA graduates have made a major contribution to Dominican agricultural and rural development literature. Their publications include scientific journal articles, technical reports, books, theses, maps, and statistical data compilations. Fifty-eight percent of the publications are student theses, which are required to obtain a B.S. degree in agriculture. Many are based on research conducted at CENDA and at private sector facilities. Twenty-seven percent of the publications are technical reports of

research results. Slightly over 7 percent of the publications are for a wider lay audience. The remainder are ISA case studies and professional journal articles.

4.3 Curriculum Innovation

ISA was the first institution of higher agricultural education in the Dominican Republic to organize its curriculum around problem/subject matter areas in lieu of a general B.S.-degree curriculum. Thus, ISA currently focuses on five areas that it deems crucial for agricultural development: the administration of agricultural enterprises, horticulture, forestry resource management, irrigation systems, and animal production.

The Dominican Government has encouraged other institutions of higher agricultural education to define major areas of concentration in their programs. This has, on paper at least, helped to avoid unnecessary duplication by defining a more efficient division of labor among the universities and has also served as a guidepost for the investment of additional developmental assistance in higher agricultural education.

Specialization has been beneficial to the student training program. First, students are better equipped to take on particular jobs when they enter the labor market because of specialized knowledge in particular subject matter areas. Second, ISA is better able to incorporate students into ongoing research and outreach programs that are consistent with their declared areas of specialization. Students adapt better to the programs and the programs benefit more from the student participation.

5. IMPACT ANALYSIS: FACTORS IDENTIFIED AS INSTRUMENTAL IN ISA'S IMPACT

5.1 Internal Factors

5.1.1 Institutional Mission

The highly civic-minded members of the Santiago Development Association (SDA) approached the task of creating ISA with a sense of community service that they have successfully encouraged everyone associated with ISA to share. ISA's stated mission is to provide a service to Dominican society through contributions to agricultural and rural development, principally through training human resources to service this sector. This orientation is reflected in ISA's curriculum, research, and outreach programs, which seek to address important societal needs.

5.1.2 ISA Leadership

ISA has benefited immeasurably from the continuous intellectual leadership and mentorship provided by SDA members. In particular, several SDA members have taken it upon themselves to ensure that ISA grows and prospers within the framework of rigorous programs dedicated to the solution of societal problems. Such problems have been defined both in broad terms, such as rural poverty and natural resource degradation, which Plan Sierra addresses, and in narrower commodity production terms, such as the need for cooking oils and higher yielding, more disease-resistant varieties of rice.

SDA leadership has also been essential in attracting outside funding to finance ISA's research and outreach programs, which complement the instructional program. SDA board members have used their influence to secure additional funding from the Dominican Government, primarily through the Secretariat of Agriculture and the President's office, and from international donors such as the Ford, Kellogg, and Rockefeller Foundations and A.I.D. SDA board members have been catalysts in bringing donor interests into agreement with the needs and interests of ISA. Funding by these donors has been responsible for much of the innovative, problem-solving activity carried out by ISA.

5.1.3 Student Selection

ISA combines its B.S.-degree program in agriculture with a vocational/technical program in agriculture, which is a source of outstanding students for its B.S.-level program. Students are recruited nationally for the high school program. In 1985, ISA visited 18 provinces and administered an entrance examination to 726 candidates. Of these, only the top 24 percent were selected. Only academic ability is used to screen candidates, because financial support is available for all high school students.

Upon graduation from ISA's vocational high school program, many students move directly into ISA's B.S. degree program. Their superior academic talents, on-farm experience, and the high quality of their high school training have enabled them to perform better than other students in the undergraduate degree program.

5.1.4 Faculty Performance

Many of ISA's nonexpatriate faculty are former ISA students. The best students of a graduating class are offered fellowships to study abroad, after which they return to ISA as junior faculty members. A potential disadvantage of this method is that the faculty is highly inbred academically. However, considering that ISA's program is superior to that of other institutions, that its graduates have been socialized to a greater extent into a service orientation and are loyal to the institution, and that the overseas training experience broadens them,{3} it is probably the most desirable method of faculty

selection. All faculty, when they return from training, provide service to ISA. Many leave, however, after several years of service because of the higher salaries offered by the private sector.

ISA has institutionalized an instructional evaluation program that involves inputs from students and faculty. These evaluations are considered when faculty are reviewed for promotion. Thus, accountability is a major facet of the teaching program and helps to promote high levels of performance.

{3}ISA-sponsored graduate trainees have been placed at various North American universities, thus avoiding academic inbreeding in the graduate training process.

5.1.5 Innovation/Change Strategy

ISA has developed an unusual set of criteria for determining which types of programs to undertake and, therefore, for which to seek funding. It considers (1) whether the problem or issue addresses a serious developmental constraint in the country; (2) whether there is sufficient interest on the part of major actors in the public or private sector to justify attention to it; and (3) whether ISA has the appropriate resources to deal with it. If these conditions are present, ISA may decide to initiate a program to address the problem, and it will also actively search for funding to support the activity. Once ISA has established a procedure for dealing with the problem or a technology that can be used to address it, the program is passed on to another institution for implementation. This strategy helps reinforce a dynamic, future-oriented research/public service agenda and forces the faculty and students to constantly direct their energies to the identification and solution of major emerging developmental constraints.

5.1.6 Openness to Ideas From the Outside

ISA has been receptive to ideas from outside the Institute. In part, ISA's openness to suggestions from important actors in the public and private sectors and to international donors may be attributed to its dependence on these constituencies for funding. It may also be due to an informal ISA policy of encouraging persistent but moderate levels of faculty turnover, which allows for the infusion of new ideas.

5.2 External Factors

5.2.1 Texas A&M Contribution

During its contract with the Ford Foundation, Texas A&M made major contributions to the ISA program in initiating the vocational/technical high school. Texas A&M, largely through Lester Buford, who directed the school in its early years,

emphasized rigor in the classroom, practical hands-on training on the school farm, discipline, an ethic of service to society, and loyalty to the institution. This orientation was reinforced by the follow-on A.I.D. contract with Texas A&M and has persisted to this day in both the vocational/technical and B.S.-degree programs. The same emphasis continues to exist at the research/extension station, CENDA, which in its early years was staffed by Texas A&M researchers.

Students may not have appreciated ISA's highly disciplined environment while they were in the program, but graduates attribute their professional success largely to the additional effort required of them by ISA. Former students assert that their edge over graduates of other programs is due in large part to the unique environment provided by ISA for its students.

5.2.2 Dominican Government Support and Institutional Autonomy

Until recently, the Dominican Government did not have a policy for higher agricultural education. Programs were allowed to begin without any Government review of the curriculum and to use whatever human and material resources were at their disposal. This condition provided ISA with the opportunity to pursue its own agenda with minimum interference. In addition, while ISA receives significant funding assistance from the Government, the Government has not interfered in the policies and operation of the Institute.

In recent years the Government has become more active in the formulation of education policy, but it has done so in a way that strengthens the distinct positions of institutions like ISA. Thus, in 1980, the Secretariat of Agriculture created the Inter-University Committee (IUC) for coordinating higher agricultural education. This committee has attempted to provide greater coordination by encouraging specialization in agronomy curricula in order to establish a division of labor among various college programs. It has coordinated investments in higher agricultural education in ways that conform with the division of labor. These national-level efforts have merged with ISA's efforts to identify areas of comparative advantage that match the problem sets it wishes to address.

ISA has benefited from substantial support from the Secretariat of Agriculture since its inception. Most support originated in programs initiated by A.I.D. This assistance has complemented that received from foundations and other sources. Support from the Secretariat has accompanied the evolution of ISA's program through three identifiable stages: (1) basic research, extension, and vocational training from 1965 to 1973; (2) specialized undergraduate training and policy research from 1973 to 1979; and (3) graduate training and advanced research from 1983 to the present (see Appendix C).

5.2.3 Competition in Higher Education

Only one other B.S.-degree program in agriculture, that of the Autonomous University of Santo Domingo (UASD), existed when ISA began its B.S.-degree program in conjunction with UCMM. Currently, there are four major degree programs and several minor programs in the Dominican Republic, and new universities are being created to satisfy consumer demand for higher education. Increased competition is reflected in recent drops in ISA's student enrollment at the B.S. level. In response, ISA is reorganizing its program to focus on serving the needs of the northern region. Future student recruitment will probably be regional rather than national and may imply changes in the quality and composition of future classes. Changes in focus may imply greater attention to regional problems and more local financial support.

6. EXISTING OR POTENTIAL CONSTRAINTS ON ISA'S IMPACT

6.1 Limited Applied Learning

The B.S.-degree program at ISA emphasizes theory. The practical aspects of the curriculum do not emphasize field experience. Rather, they incorporate practice through laboratory work related to theory and through visits to farms. The horticulture and forestry programs probably provide the most hands-on experience.

ISA's administration and faculty are cognizant of the need for greater hands-on training and would provide it if funding were available. However, ISA's program actually includes more practical training experiences than do the other programs in higher agricultural education in the Dominican Republic.

Lack of applied learning experience corresponds with a heavy reliance on the lecture method. The case study approach developed by CADER has been used in the agribusiness program but is not much used in other ISA programs. In part, the excessive reliance on the lecture method reflects the limited availability of library materials and equipment for applied learning. Most professors consider available library materials to be out of date. The library has been unable to make new acquisitions because of a lack of funds. Many holdings are not in Spanish and therefore cannot be read by the students. As a consequence, the library is not used extensively by either professors or students.

Many of the facilities and equipment, both on the college farm and in the laboratories, are in need of repair.

6.2 ISA's Role in Research and Outreach

ISA has been concerned from its inception with the integration of research, outreach, and instruction. Initially, the Institute achieved this integration through the SCAD research and extension station. However, its ability to link these activities

was significantly reduced when ISA lost control of SCAD. Efforts to establish similar interrelationships among these functions through Plan Sierra have not worked well, largely because of funding problems, course scheduling at ISA and UCMM, and philosophical differences between the various parties involved in the program.

The recent appointment of a new director of CENDA, who will function concurrently as director of research at ISA, should help create the base for stronger ISA involvement in research. Nevertheless, the issue of institutionalizing a complementary network of research and outreach links with ISA still remains outstanding.

6.3 Domestic Funding and Service to Clientele Groups

To the extent that ISA remains dependent on outside sources of funding it will probably remain responsive to their needs and goals. The key in ISA's case is to partially transfer this dependency for funding from international donors to national interest groups active in the agricultural economy. In this regard, A.I.D.'s current objective is to encourage ISA to raise funds from the domestic private sector, by selling more services to agribusiness and commercial agriculture. However, private sector groups with the ability to pay for such services typically do not have the interests of the small-farm sector in mind. If ISA is to continue to address the needs of the small farmer, it may need to continue to secure more funding from the public sector, particularly if international donor funding begins to decline. This alternative carries the potential risk of becoming involved in a political patronage system that deflects public agencies from their primary goal of public service to that of political control.

6.4 Scientism versus Vocationalism

Bonnen (1974) articulated the creative tension that exists in U.S. land grant colleges of agriculture between forces pushing for greater scientific productivity, represented by research along disciplinary lines, and forces pressing for greater short-run contributions to the agricultural sector, represented by vocational agriculture and extension/technical assistance efforts.

These competing orientations are present to various degrees in the curriculum and professional activities of the land grant colleges of agriculture. ISA, perhaps due to the Texas A&M influence, has experienced these tensions from its inception. The vocational curriculum was originally designed to provide both practical training through the practice of agriculture on ISA's farm and rigorous classroom academic training. The vocational dimension to its curriculum remained for the high school program, but the B.S.-degree curriculum has given greater emphasis to academic training. Practical training for B.S.- degree

candidates is represented largely by required thesis research.

ISA recently decided to replace its high school program with a 3-year associate degree program and is contemplating the creation of graduate programs. These decisions may further favor a scientific orientation over a vocational orientation.

The Dominican Educational Fund and other observer organizations (World Bank 1984) have noted the relative overabundance of Dominicans educated at the university level and the shortage of trained technicians at the secondary level. This situation suggests that ISA may want to maintain its focus on vocational/technical education. Its vocational graduates have been favorably evaluated by employers in comparison with graduates of other secondary educational institutions largely because of having received this type of training.

However, the costs of this type of education are high. The field laboratories, including the school farm, must be maintained. In addition, there are high costs associated with the supervision of these activities by faculty and staff. ISA will have to consider the availability of outside governmental and nongovernmental funding for this type of education in contrast with that available for graduate programs and the research productivity these programs represent.

6.5 Presence in Santo Domingo

Santo Domingo is the capital city and the power center of the Dominican Republic. It is where the legislature deliberates, the major Government agencies are located, and national decisions of import are made. As a consequence of its location in Santiago, ISA is somewhat disadvantaged in its efforts to directly influence Government policy and to mobilize resources for meeting its funding requirements.

There are several ways in which ISA may wish to consider increasing its presence in Santo Domingo. One way would be to establish an office with a small staff, whose assignment would be to maintain a constant flow of communication with key individuals in the Government, the private sector, and the international donor community. Another way would be to initiate a regional campus dedicated to providing training primarily for individuals working with national agricultural development agencies.

7. LESSONS LEARNED

1. The development of strong linkages between an agricultural college and its primary bureaucratic constituency, the secretariat or ministry of agriculture, is of crucial importance in ensuring that the college has access to a policy and institutional forum supportive of its research and outreach goals. ISA's strongest bureaucratic linkages are with the Secretariat of Agriculture. Because it views agricultural research and

outreach to the rural sector as a major complement of its educational mission, the Secretariat represents the primary forum for ensuring that the Institute has the necessary support to pursue such interests. Many of the A.I.D. projects with ISA were funneled through the Secretariat of Agriculture in order to build support linkages between ISA and the Secretariat.

2. Donor agencies should follow their efforts in creating institutional capacity with project-specific funding designed to build linkages in research and outreach activities to the rural sector. A.I.D. and other donor funding for the establishment of ISA was followed by a succession of projects, some of which still remain active, to extend ISA's services and contributions to the rural sector. The funding has gone to programs that implied a change from past ways of doing things. Thus, funds were used to explore new areas of analysis and action, to provide opportunities for faculty to become directly involved in problem-solving activities. In effect, these funds have helped ISA to persist as a vital and socially relevant institution. Finally, many of these projects were funneled through the Secretariat of Agriculture in order to build stronger support linkages between the Government and ISA.

3. Moderate levels of resource scarcity can serve to generate institutional entrepreneurship, and thus donor funding should be designed to reinforce rather than weaken such initiatives. Except for an initial institution-building loan, A.I.D. funding for ISA has been serial and conditional in nature. In addition, such funding has been supplemental and never overwhelming in scale. As a consequence, A.I.D.'s external support has not served to dampen ISA's entrepreneurial spirit. In fact, A.I.D. support is a result of ISA's own aggressive initiatives in seeking such funding. To ensure continued institutional entrepreneurship, donor funding, beyond the initial building of core institutional capacity, should be provided as categorical project and program grants awarded in response to college initiatives in addressing major societal problems

4. Institutional autonomy appears to be a precondition for institutional entrepreneurship, and therefore funding from national and international sources should not infringe on the basic autonomy of the recipient college. The high level of institutional entrepreneurship and innovation manifested at ISA appears to be associated with high levels of institutional autonomy vis-a-vis its home university and the national Government. Institutional autonomy provides an opportunity for institutional entrepreneurship, an opportunity that ISA leadership has seized in controlling faculty appointments, setting program agendas, redesigning curricula, and mobilizing resources from a multitude of national and international sources. The kind of leadership evident at ISA may be a necessary characteristic of an effective institution, but institutional autonomy and the opportunities therein for creative action may be the necessary precondition for attracting such dynamic and capable leadership.

5. Institutional autonomy needs to be coupled with more direct forms of accountability in ensuring college responsiveness to social needs. There is a universal tendency for institutions and bureaucracies to become routinized over time, with an attendant propensity for means to replace ends. In the case of institutions of higher education, this tendency is manifested as a concentration on student training with little concern for the purpose for which students are being trained. ISA has avoided this tendency, largely because of the leadership of the SDA. As a community-based organization in its own right and through its representation on ISA's board of directors, the SDA has exercised support and influence to ensure that ISA remains attuned to the needs of the rural sector.

6. Moderate levels of faculty turnover may be desirable in order to ensure innovation and creativity in faculty instruction and research and thereby to avoid natural tendencies toward institutional ossification. The SDA takes a particular interest in ensuring that ISA has a strong and dynamic faculty. It accomplishes this goal by serving as a patron in selecting the most talented of ISA's graduates for advanced, overseas degree training; ensuring their employment at ISA upon completion of their training; and several years later, recruiting many of them for positions in the private commercial sector. Such a process produces moderate levels of faculty turnover at ISA and an influx of new energy and ideas from incoming faculty.

APPENDIX A

STUDY METHODOLOGY

by

David O. Hansen

Study team members were all familiar with the Dominican Republic and the Superior Institute of Agriculture (ISA), having previously collaborated on development assistance projects related to them. The data-gathering process for this study included interviews with students, clientele who use ISA's resources, and key actors in shaping agricultural policy and programs in the Dominican Republic, including key members of the Santiago Development Association. In addition, interviews were conducted with the ISA faculty and administration as well as with current students at ISA and members of the USAID Mission.

Interview data were supplemented by two empirical studies conducted by Dominican consultants who were commissioned by the study team. One study included a tracer survey of ISA graduates and their employers. It was designed to provide insights into the strengths and weaknesses of ISA's training program, the productivity of ISA graduates, and the quality of these graduates in comparison with those from other institutions. The

second study concerned the scientific productivity of ISA graduates as measured by written materials. A recent list of all scientific materials related to Dominican agriculture and rural development was analyzed to determine the relative contribution by ISA graduates. During this period, available bibliographic material for subsequent perusal and analysis was also collected.

Chronologically, the study included a July 1985 meeting in Washington, D.C. with the Project Manager and other members of A.I.D.'s Center for Development Information and Evaluation (CDIE) to discuss the purpose and objectives of the study. This was followed by an initial 2 weeks of field research in the Dominican Republic in late July. During this period, the team interviewed USAID Mission personnel, ISA personnel, and key informants in the public and private sectors, including members of the Santiago Development Association.

Data from these interviews were useful in formulating initial ideas about the impact that ISA has had on Dominican agricultural and rural development, factors that have affected ISA's performance, major issues facing ISA, and generalizations about the institution-building process.

In November 1985, after holding a 1-day meeting in Washington, D.C. with the Project Manager and other CDIE staff, the team returned to the Dominican Republic to test initial impressions. The spacing of the two field trips was fortuitous because a change in Government and party administration had occurred in the interim and had a direct impact on ISA. For example, ISA's director in July was the Secretary of Agriculture in November. During this period, follow-up interviews with key informants, including ISA staff, were conducted to ascertain the validity of initial team impressions. Special attention was given to ISA's curriculum by Drs. Merritt and Del Rio during this period. This period was also used to draft the body of the report and to distribute it for review to A.I.D. personnel, ISA staff, and key informants. Feedback from them was incorporated into the final report.

APPENDIX B

THE ROLE OF THE SANTIAGO DEVELOPMENT ASSOCIATION IN THE CREATION OF ISA

by

Gustavo Antonini

1. INSTITUTIONAL ORIGINS

The Santiago Development Association (SDA) is a private, nonprofit organization dedicated to the precept that socially responsive entrepreneurs, through private sector initiatives, can contribute meaningfully to modernization and development in the

Dominican Republic. It is a prototype development institution, one equipped with the technical know-how, financial resources, and a work ethic free from any motive other than that of serving the public good (Arturo Grullon E. 1986).

The SDA has been a key element in the creation and growth of the Superior Institute of Agriculture (ISA). The SDA members responsible for ISA's administration and leadership have been the driving force sustaining the Institute's programs and financial base over the past 25 years.

The SDA was created by 12 business and professional leaders of Santiago city in July 1961, less than 6 weeks after the death of dictator Rafael Trujillo. They recognized the dramatic changes in political directions underway in their country, the possibility of establishing a free enterprise system, and the need for private, community-based institutions to bolster the national development process (Espaillat M. 1986a). Five priority areas -- education, natural resources, development planning, technical assistance, and quality of life -- have been the focus of SDA projects, and agricultural education has been a top priority since SDA's inception (Arturo Grullon E. 1986).

The scarcity of trained agronomists, considered a serious constraint to modernizing the country's agriculture, propelled agencies in the early 1960s to commission a series of studies exploring the establishment of an agricultural training and research center (Hartzog 1962; Knebel et al. 1962; Lewis et al. 1966). ISA, the center's high school, and the Center for Scientific Agricultural Development (SCAD), the research and public information unit, were opened in 1964 (Lewis et al. 1966).

The SDA was a critical force in establishing the ISA-SCAD center. It purchased a 60-hectare parcel of land in May 1962 by raising RD\$39,000 from firms in Santiago city. The SDA obtained long-term financing from the Dominican State Secretariat of Education in the summer of 1962 to pay teachers' salaries. The Agency for International Development (A.I.D.) provided RD\$687,500 for building construction and RD\$72,500 for equipment. The Ford Foundation donated US\$735,500 for ISA's development, US\$188,000 directly to the SDA in the autumn of 1962 for the high school training program, and US\$547,500 in February 1964 through Texas A&M University for the SCAD program (Watkins 1968).

ISA and SCAD were conceived by the SDA as a unified, national, collaborative effort by the public and private sectors to improve Dominican agriculture (Watkins 1965). The SDA, in creating ISA and SCAD, channeled the resources of its members and those obtained from the Government of the Dominican Republic, international lenders, and donor agencies to develop an institution in its own likeness, with the mission of providing solutions to social and economic problems facing Santiago, the Cibao Valley, and the Dominican Republic.

2. SDA DEVELOPMENT THEMES AND PROGRAMS

The Dominican Republic in the early 1960s was poised at the threshold of development. Hope for a more promising future was counterbalanced by the vast needs of the present: to combat malnutrition, to deal with economic stagnation, and to arrest explosive population growth. These complex and varied development problems, especially those that focused on incorporating masses of the rural poor into the country's lifestream, called for pooling resources and shouldering responsibilities by public and private sectors alike to formulate and implement socially responsive and economically viable development programs.

The SDA was a Dominican private sector response to these national development needs. A perusal of SDA programs over the 1962-1986 period uncovers several fundamental development themes that help to explain SDA's mission in creating and maintaining ISA's programs.

The active participation of the private sector in the development process is the heart of SDA programs (Espaillat M. 1986a). This view was held by the 12 SDA founders, who considered the North American entrepreneurial system of sociopolitical development in a free market economy to be a viable model for the republic's growth (Espaillat L. 1986). SDA programs over the years have reflected increasing social responsiveness to development needs (Thomen 1986). The SDA believes that the private sector has a moral obligation to participate at the local, regional, and national levels in development decisions (Nunez 1986).

The SDA promotes community, private sector involvement in the development decision-making process. SDA forums and conferences serve as sounding boards for private initiatives. Outgrowths include the creation of the Santiago and Puerto Plata Free Trade Zones, the Santiago Aqueduct Corporation, and Plan Sierra. The SDA has served as a role model for other private, regional development associations in the republic. It actively collaborates with the Development Association of the South (ADESUR) and the Development Association of La Vega (SDA 1985). The SDA fosters regional growth of the Cibao Valley. On the one hand, this development thrust is based on the availability of resources -- cultural, economic, physical, and administrative -- in Santiago and the adjoining region, and the need to attract and retain workers, business people, and professionals to sustain economic development (Espaillat M. 1986a). On the other hand, it is a local response to counter the increasing dominance of the capital city, Santo Domingo, over the social, economic, and political life of the country (Espaillat M. 1986a).

SDA's conferences on integrated development of the Cibao Valley (1970), the future of Santiago (1976), and position of the Cibao Valley within the context of development in the Dominican Republic (1984) have called attention to this imbalance in the distribution of resources and have led to specific regional growth strategies. SDA presently is promoting two regional

projects: the creation of a planning department to formulate and sponsor regional development initiatives (Alejandro Grullon E. 1986) and the building of an agroindustrial park with warehousing and jetport facilities to handle the export of the region's agricultural products and handicrafts (Adames 1986).

Linked to the promotion of regional growth is SDA's moral commitment to broaden the level of popular participation by including small farmers and the urban poor in the development process. The Association promoted the creation of credit institutions, such as the Home Savings and Loan Association (La Previsora), to channel resources to marginal sectors where traditional sources of credit for low-cost housing were not available (Thomen 1986).

The SDA helped to establish the republic's first nonprofit development bank (FONDESA) to improve the credit base of small producers and associated groups in the industrial and agricultural sectors. The SDA also established the Small Enterprise Assistance Program (PROAPE) in 1981 to channel technical aid to small businesses. This aid has led to improved efficiencies within the informal sector and the creation of new jobs (SDA 1985; Thomen 1986).

Professional training and technical assistance through technology transfers are hallmarks of SDA programs. The SDA created a formal education base in the region by establishing ISA and Madre y Maestra Catholic University (UCMM) in Santiago in 1962 (Waggoner and Waggoner 1986). In recent years, the SDA has devoted more attention to nonformal technical training through PROAPE and the Center for Research and Improved Animal Production (CIMPA). SDA's technical assistance programs include SCAD (now the Northern Agricultural Development Center--CENDA) agricultural research and extension projects; ISA's Center for Economic and Food Research (CIES) studies, publications, and conferences; and CIMPA's projects in native dairy cattle production and fish culture (Thomen 1986).

Natural resource management is another important SDA development theme. SDA members who sat on ISA's directive council in 1976 endorsed the forestry concentration in the ISA-UCMM curriculum. In 1978 the SDA sponsored a natural resource management program for the Sierra region. The Association created a Regional Forestry Foundation in 1983 to coordinate public and private efforts in forest management, especially in the northern mountain range (Arturo Grullon E. 1986).

The SDA actively sponsors agroforestry research on its Sanita lands (SDA 1985). The objective is to determine the ecological viability and economic feasibility of using fuelwood farming as an income generator and energy producer in fragile steepplands. The SDA also sponsors environmental legislation to promote private sector initiatives in agroforestry and fuelwood production (Crouch 1986).

It is difficult to find another place in the Dominican Republic quite like Santiago city, with its harmonious mix of a strong work ethic and an appreciation of the arts, and where decision-makers are aware of their social responsibilities to make their home town a dignified place to live. The SDA reflects its Santiago roots; improving the quality of life -- intellectual, artistic, physical, business, and recreational -- has been an important Association goal since its inception in 1961 (SDA 1983). Through ISA, the SDA has had a fundamental impact on Santiago's quality of life by raising educational levels and preparing Dominicans in fields that have contributed significantly to human development in the region. Current SDA goals include financing a 2,000-seat city auditorium and providing a potable water supply system for the 500,000 inhabitants of 87 towns in the central Cibao Valley (Espaillat M. 1986a).

3. SDA-ISA RELATIONSHIPS

ISA was created in August 1962 as an SDA program under an international agreement signed by the Government of the Dominican Republic, A.I.D., and the SDA. ISA functioned for 18 years as an integral program of the SDA. Decisions regarding ISA's program development, leadership, and financial support between 1962 and 1980 rested with SDA's directive council.

By November 1980, the SDA believed that ISA had matured sufficiently to warrant incorporation as a distinct entity (Espaillat M. 1986b). This decision was in keeping with SDA's goal to mold ISA into a self-sufficient development institution (SDA 1985). Both organizations agreed that their legal separation should be conditioned on maintaining SDA's political support of ISA through participation in ISA's directive council (Espaillat L. 1986).

These direct institutional links have been instrumental in providing the support and leadership needed to sustain ISA. During the 1960s, the SDA provided a nexus for ISA's international backing that could not have been provided by public institutions at the time because they lacked a comparable institutional base: financial integrity, human resources, and organization (White et al. 1966).

Since its inception, ISA has been able to maintain Government support through its direct access to the country's power base via former presidents Antonio Guzman and Salvador Jorge Blanco, both SDA members, and SDA founder and current ISA President Victor Espaillat, who is a close friend of four-term, incumbent President Joaquin Balaguer.

Luis Crouch, another SDA founder, has been instrumental in establishing ISA's credibility in international agricultural development circles. This has enabled ISA to compete successfully for external funding.

ISA's institutional goal of developing training and research programs that respond to the republic's socioeconomic development needs mirrors SDA's philosophy. ISA's ability to maintain these programs is linked to SDA support. The initial high school vocational program was a direct outgrowth of SDA initiatives through the personal contacts of members Luis Crouch and Tomas Pastoriza with the Ford Foundation and Texas A&M University (Watkins 1968). In 1968, ISA began offering a joint university degree program with UCMM, another institution established by the SDA.

4. MENTORS

The sustained personal commitment of two SDA founders, Victor Espaillat and Luis Crouch, loom large in explaining ISA's vitality and success. Their indefatigable efforts, sound financial management, and intellectual leadership have sustained ISA's program. They have achieved this while fulfilling their other responsibilities of presiding over businesses and serving on public commissions. Both are unique individuals whose special qualities have left indelible imprints on ISA and its staff.

Espaillat is a self-made businessman, an intellectual, intensely proud of his roots in the Cibao Valley, and committed to making Santiago a dignified place to live. He served as SDA's first president, was ISA's president during the decisive growth period of the mid-1960s, and has been ISA's president since 1980. He maintained an active presence on the councils of both SDA and ISA during the interim years. Espaillat has provided ISA with an unerring sense of pragmatism, sound business practices, and a sensitivity to the broader needs of society and the environment.

Crouch has served as the intellectual role model for ISA's staff. Of Dominican-American heritage, U.S.-trained, and an internationally recognized agricultural developmentalist, Crouch has provided ISA with the scientific leadership needed to successfully identify and pursue programmatic responses -- regional development (Plan Sierra), rural development administration (CADER), agroforestry (COENER) -- to meet the country's changing development needs. Crouch intuitively understands the country's needs, speaks the development language, and projects ISA's dynamic image in Santo Domingo, Washington, and elsewhere. He, too, has maintained an active presence on the councils of ISA and SDA, but his presence transcends ISA's boardroom. Crouch is the major force shaping ISA's programs and staff.

Victor Espaillat and Luis Crouch have an overriding commitment to their country's development. They are the personification of the socially responsive entrepreneur and a testament to the Dominican economic and political "miracle" of the post-Trujillo period (Harrison 1985).

5. FUTURE LEADERS

SDA's 39 members today bridge two generations. There are the Victor Espailat, Luis Crouchs, and Tomas Pastorizas, as well as their sons, nephews, and disciples, and other younger generation professionals and business leaders of Santiago city. This new leadership is assuming increasing responsibilities, especially since the reigns of power were symbolically passed by founder Victor Espailat to the second generation of SDA members in July 1986 at their 25th anniversary meeting (Espailat M. 1986a). An orderly transition is being implemented with the founders' support in an advisory role on the council (Arturo Grullon E. 1986).

The ISA-SDA link has been positive and direct over the 1962-1986 period. Will the relationship change as a new generation of SDA leaders assumes command? A perusal of the list of SDA and ISA council members suggests the extent of possible changes and the degree of future institutional linkages.

SDA's council numbers 16 and includes three founders (Victor Espailat, J. Armando Bermudez, and Arturo Grullon) and six second-generation members (Victor Espailat's son, Felix Garcia, Agripino Nunez, Emilio Peralta, Norberto Quezada, and Frank Thomen) (SDA 1985). ISA's directive council numbers 12 and includes seven SDA members: three founders (Victor Espailat, Luis Crouch, and Tomas Pastoriza) and three second-generation members (Norberto Quezada, Frank Thomen, and Emilio Peralta) (ISA 1985). The three second-generation leaders who are members of both councils will help to ensure continued SDA support for the Institute. Continuity is also reinforced through the Victor Espailats, father and son. Victor Espailat is ISA's president and a member of SDA's Directive Council. Victor Espailat's son is a member of ISA's Council and SDA's vice-president; the member occupying this post traditionally assumes the presidency. A clear transition is taking place from father to son in the SDA leadership. How will this affect ISA and SDA's future program directions?

Victor Espailat's son is an engineer and businessman, trained in the United States and Canada, with strong ties to Santiago and the Cibao Valley, and deeply committed to maintaining and strengthening SDA's commitment to a vigorous development agenda (Espailat L. 1986). He feels a strong sense of duty and social consciousness and has expressed this publicly: "To those of us, the second generation of business leaders, corresponds the commitment to work on the same social problems that have concerned our forefathers.... We can search for solutions [to these problems] through methods to improve traditional systems of production in the agricultural and industrial sectors.... We [the second generation of SDA members] must fight by the side and for the rights of the disadvantaged,

so that they can assume their rightful place in our society" (Espaillat L. 1986).

Individual SDA leaders have continued to play key advisory roles in management and program development. Dependence on such individuals may reflect, as some scholars suggest, vestiges of the caudillo system (Murray 1968; Sharpe 1977; Walker 1972). However, rather than constraining progress, the paternalistic influence of Victor Espaillat and Luis Crouch and the strong support of the SDA have stabilized and strengthened ISA as an institution. A transition from Espaillat father to Espaillat son is occurring in SDA's leadership. This may carry over positively to ISA because Victor Espaillat's son has indicated an eagerness to assist ISA in management and fund raising. What is not clear is who, within or outside the SDA, will succeed Luis Crouch as ISA's intellectual mentor.

APPENDIX C

THE ROLE OF A.I.D. IN THE DEVELOPMENT OF ISA AND ITS RELATIONSHIP WITH THE SECRETARIAT OF AGRICULTURE

by

Gustavo Antonini

1. BACKGROUND

Dominican policies to modernize the agricultural sector are a post-Trujillo (1961) phenomenon and reflect conscious efforts to mobilize resources in order to effect comprehensive, across the board changes in the structure of agricultural production. The Dominican economy prior to 1961 functioned to benefit the Trujillo dictatorship, and the agricultural sector, the mainstay of the country's economy, was tightly controlled by restrictions on land, capital, and labor (Wiarda 1968). Government policies of the early 1960s recognized the need to broaden access to resources in order to stimulate the country's development (Martin 1966). The creation of an institutional base was deemed a prerequisite for agricultural development (White et al. 1966).

The early post-Trujillo era coincided with major new initiatives in international technical assistance and development financing. The U.S. Government's foreign policy initiatives for third world development, formulated in the Alliance for Progress program, targeted the Dominican Republic for massive injections of foreign aid. The Dominican revolution in 1965 further intensified international agricultural development assistance to the republic.

A.I.D.'s support played a critical role in the institutionalization of this agricultural development process. Since 1965,

A.I.D.-sponsored programs, administered by the State Secretariat of Agriculture, have not only benefited the sector as a whole but have also assisted local institutions, such as the Superior Institute of Agriculture (ISA), in program and manpower development, equipment purchase, and infrastructure development. An analysis of the evolving relationship between the Secretariat of Agriculture and ISA illustrates A.I.D.'s role in building institutional linkages in this developing country.

2. INSTITUTION-BUILDING INITIATIVES

The 31-year Trujillo dictatorship left the Dominican Republic with virtually no organizational structures conducive to development (Wiarda and Kryzanek 1982). This was especially true in agriculture, where there was a Ministry of Agriculture in name only and only a handful of professionally trained agronomists. While food production remained unchanged from 1960 to 1965, population increased annually by 3.5 percent, resulting by 1965 in serious food shortages. This was the situation when the A.I.D.-Texas A&M University contract was signed in April 1965 and Texas A&M began working with the Secretariat of Agriculture (White et al. 1966).

An explicit objective of this project was to make the Dominican Republic self-sufficient in food and fiber. In addition to introducing short-term activities to increase agricultural productivity and farm production, the project included long-term assistance to foster continuing agricultural development, through the training of technical, professional, and administrative staff (Beach and Murphrey 1973).

The project broke with the former dictator's policies of concentrating resources and decision-making in Santo Domingo city by introducing decentralized agricultural operations administered by regional offices. Santiago city, situated at the hub of the republic's important Cibao agricultural region, became a focus of training, research, and extension services, and in 1965, ISA was designated as an agricultural service facility and training center.

Between 1965 and 1973, the project provided substantive support to ISA to upgrade vocational training and augment its professional service staff. Two project advisers in agricultural education and regional development worked full-time at ISA from 1966 to 1970 and assisted in modernizing the school's curricula and course content (Beach and Murphrey 1973). Short-term project staff supported the establishment and operation of the soils testing and seed improvement laboratories at ISA's Center for Scientific Agricultural Development (SCAD) facility (Watkins 1968).

The project also supported undergraduate training abroad. More than 100 Dominicans received scholarships for advanced agricultural training through the A.I.D. project and a project

administered by the Dominican Educational Credit Foundation and Texas A&M. Forty-seven of these scholarships were awarded to ISA faculty and graduates (Beach and Murphrey 1973).

The Secretariat of Agriculture and ISA developed a close relationship during these formative years. Fernando Alvarez Bogaert, the incumbent Secretary of Agriculture from 1966 to 1970, had worked earlier at ISA as a SCAD researcher (Watkins 1968). He had a professional commitment to ISA's growth. There were family bonds between Alvarez Bogaert and Luis Crouch and Victor Espaillat of the Santiago Development Association (SDA), as well as friendships with SDA members that helped solidify the Secretariat's commitment to ISA during this period.

3. COORDINATING UNDERGRADUATE PROGRAMS TO MEET SMALL-FARMER NEEDS

The Dominican Republic in the mid-1970s faced rising food prices, shrinking foreign reserves, rapid urban growth, massive rural-to-urban migration, and a high rate of population increase, factors that prompted vigorous debate concerning the focus of agricultural development and the role of public and private institutions in the development process. An underlying concern was to increase farm productivity in a manner that would improve the quality of life for small farmers and arrest the flood of migrants to the cities (Aquino Gonzalez 1978).

The rural growth strategy that emerged focused on selecting and pursuing the best available options for maximizing limited human, institutional, and financial resources in order to improve social and economic conditions of the local farmers (Antonini 1978). The technology required to increase food production was available. What was lacking was an effective mechanism whereby this technological information could be adapted to local agrosocioeconomic conditions and adopted by small farmers (UNICA 1976).

The strategy that evolved called for changes in the form and substance of agrosocioeconomic training, research, and outreach to the farm community. Such changes could be effected only by creating an institutional framework whereby educational institutions and Government agencies could cooperate in carrying out rural development projects. The A.I.D. Small Farmer Program I loan (PPA I, 1975-1977) provided US\$1.5 million and the Small Farmer Program II (PPA II, 1977-1979) provided US\$256,348 to create a framework for these new policy initiatives (Martinez Richiez 1981).

Agronomy faculties had been established at the Autonomous University of Santo Domingo (UASD) in 1962, at Pedro Henriquez Urena University (UNPHU) in 1967, and at ISA and the Madre y Maestra Catholic University (UCMM) in Santiago in 1968. Each university offered general training in the agricultural sciences. Only informal lines of communication operated between the

schools, while university contacts with the Secretariat of Agriculture were sporadic. PPA I proposed to establish a formal working relationship between the Secretariat and the three agricultural schools. Such a relationship, it was reasoned, could develop into a coordinated system of agricultural training, research, and extension that would match future university agricultural training and research activities with the Secretariat's outreach efforts, and thus more fully meet the extension needs of small farmers.

To achieve this objective, the Secretariat of Agriculture established an Inter-University Committee (IUC) in August 1975 to prepare guidelines and monitor the US\$1.5 million university professional training component of PPA I (SEA n.d.b). The Secretariat also created an Office of University Coordination (OUC) to implement the guidelines. The former dean of the UASD agricultural sciences faculty was appointed OUC director and IUC Chairperson. The OUC implemented a series of IUC directives between 1975 and 1979 to promote cooperation between the Secretariat and the universities in developing and coordinating research, sponsoring workshops, supporting faculty and student training, and subsidizing the publication of research findings (Martinez Richiez 1981). Seven years after PPA II's termination, both IUC and OUC continue to support cooperative Secretariat-university activities.

PPA I also focused on expanding the range and depth of B.S. training by developing fields of specialization keyed to national manpower and production goals. The program, in essence, sought to upgrade the professional competence of future B.S. graduates while maintaining the undergraduate level of instruction. A.I.D. provided 30 short-term consultants to the three participating schools to design new programs, identify equipment needs, and formulate long-range university development plans (A.I.D. 1974).

UASD developed concentrations in soils, plant pathology, and breeding within its agronomy program; UNPHU specialized in agricultural education (Martinez Richiez 1981). The A.I.D.-supported consultants worked with ISA-UCMM in creating technology-focused concentrations in drainage and irrigation, agrarian reform, agricultural economics, horticulture, food technology, and forestry. These new curricula were formalized in February 1976 (Martinez Richiez 1981).

Program support was provided for the advanced training of university staff in the technology-focused fields. A total of 58 faculty from UASD, UNPHU, and ISA-UCMM received scholarships: 20 (34 percent) went to ISA professors, of which 4 received short-term training, 14 received an M.S. degree, and 2 a Ph.D (SEA 1980).

ISA received 33 percent (RD\$334,000) of PPA I funds allocated for laboratory equipment and library purchases and 50 percent of construction funds (RD\$200,000) for laboratories (plant physiology, pathology, entomology) and dormitories (Martinez Richiez 1981). More than 50 percent of

programsponsored trips abroad for the purpose of establishing professional contacts with research centers and universities were made by ISA faculty (Martinez Richiez 1981). In sum, by upgrading instructional programs and faculty resources, PPA I established the institutional framework for collaboration between the Dominican Government and universities.

PPA's second phase, which began in 1977, provided funds to develop the universities' problem-solving research capabilities in key agricultural policy areas. PPA II offered the Secretariat of Agriculture scientifically derived solutions to critical problems in the agricultural sector and provided the university faculties with funds to channel their intellectual, scientific resources toward practical national concerns (Martinez Richiez 1981).

Between 1977 and 1979, PPA II contributed 46 percent (\$256,348) toward the three universities' \$554,716 agricultural research budgets. The ISA-UCMM research program represented 27 percent (\$149,450) of this total research expenditure and 33 percent (\$83,984) of PPA II contributions. ISA projects included a \$21,296 (56 percent from PPA) dry forest energy survey and a \$16,266 (34 percent from PPA) Sierra land tenure study; a \$59,164 (45 percent from PPA) small-farm technology project; a \$23,027 (83 percent from PPA) rural poverty policy research study; and a \$29,697 (70 percent from PPA) feasibility study of wheat substitutes (SEA n.d.a; SEA 1982).

The relationship between ISA and the Secretariat of Agriculture during this period benefited also from the dynamic leaders who occupied the position of Secretary of Agriculture. The policy of technically upgrading the Secretariat's executive and middle management positions, begun during the tenure of Alvarez Bogaert in the late 1960s, was intensified under Secretaries Carlos Aquino (1973-1975), Pedro Breton (1977-1978), and Hipolito Mejia (1978-1982).

The Secretariat's decision process governing program support came to be based more on technical justifications and less on political expedients. ISA was rapidly evolving into one of the strongest technologically based agricultural science programs and profited accordingly. Nonetheless, the fact that both former Secretaries Breton and Mejia were native sons of Santiago city and had close ties with Victor Espaillat, Luis Crouch, and other members of the SDA indirectly strengthened ISA's bargaining position within the group of universities competing for scarce Dominican Government resources.

4. CREATING FUTURE GRADUATE TRAINING AND RESEARCH PROGRAMS

Dominican agricultural schools during the 1970s took significant strides in matching undergraduate training and research programs with national development needs. The introduction of technology-focused concentrations and policy

research, implemented through collaborative agreements with the Secretariat of Agriculture, were noteworthy accomplishments in which ISA actively participated as a full partner. Notwithstanding these efforts, and the A.I.D. subsidies for upgrading faculty and funding research, by the late 1970s, the republic's need for trained agricultural professionals outstripped its supply (SEA 1979b).

Agricultural production during these years lagged behind population growth. Prominent among the several factors that contributed to the sector's mediocre performance was the scarcity of professionals and administrators capable of assessing problems and designing technically and economically feasible solutions. The chronic problems of low productivity and falling production argued against relying on simple answers and quick solutions.

A sustained commitment by public and private sectors was needed to devise and disseminate more productive farming systems and better methods of crop management. Such improvements required the continued upgrading of agronomic teaching and expanded research. These responsibilities had shifted increasingly during the 1970s to the Dominican agricultural schools. Government policy directives in the early 1980s underscored the need to strengthen these programs and further raise the competence of their graduates (USAID 1983b).

In 1982, ISA took an important step in this direction. The ISA-UCMM Center for Rural Development Administration (CADER) began operations that year with a US\$247,000 grant from the Kellogg Foundation. This donation was supplemented shortly thereafter by US\$800,000 from A.I.D. Over the past 4 years, CADER has offered intensive short courses to hundreds of executives and mid-level administrators from public institutions. The Center's plans call for creating a master's program in development administration, with an annual graduating class of 50 professional administrators. This graduate program is closer to fruition today since ISA was elevated to university status by Presidential Decree No. 651 (Gaceta Oficial 1986) on July 31, 1986.

ISA and the other Dominican agricultural schools need to expand their teaching programs and improve their research facilities if they are to meet the challenges of the 1980s and beyond. A manpower assessment of 13 public agricultural institutions in 1982 identified a need for 514 graduate-trained professionals by 1987. ISA, for example, needs an additional 22 professionals with M.S. degrees and 9 with Ph.D degrees to meet its future commitments. The A.I.D. Agricultural Sector Training project (517-0160) is designed to assist ISA and other institutions, both public and private, to meet these professional manpower needs.

The A.I.D. project provides a US\$5.0 million loan, matched by a Dominican Government contribution of a RD\$3.0 million, over the 1983-1990 period to strengthen agricultural teaching research-extension institutions (A.I.D. 1983b). The InterUniversity

Committee, established under PPA I, provides leadership and coordinates project activities by the Secretariat of Agriculture and the participating Dominican agricultural schools, ISA-UCMM, UASD, UNPHU, and the Central University of the East (UCE).

The administrative responsibilities of the Secretariat of Agriculture are considerably less under this project than they were under PPA I and II. This A.I.D. project is being implemented by the Office of International Technical Cooperation within the National Planning Office (ONAPLAN). The project is an improvement in several ways over earlier efforts at university-Secretariat of Agriculture coordination of programs. It establishes a sectorwide system to determine and monitor the advanced training needs of up to 10 public institutions and the four agricultural schools.

Assistance is available to the agricultural schools to develop an overall plan that will identify the human, material, and financial requirements for creating and strengthening graduate programs commensurate with the academic specializations of the returning trainees. Funds are available to finance 130 scholarships for advanced study abroad. The project also subsidizes and encourages in-country thesis research on priority topics (A.I.D. 1983b).

5. CONCLUSIONS

A.I.D.'s support played a critical role in the institutionalization of the agricultural development process in the Dominican Republic. In particular, as this analysis of the evolving relationship between the Secretariat of Agriculture and ISA illustrates, A.I.D. helped to build linkages between public and private sector institutions. The history of relations between the Secretariat and ISA furthermore demonstrates the direct and latent impacts of countrywide technical assistance programs on primary and secondary recipients. There are several conclusions.

1. Three stages can be identified in the A.I.D.-ISA institution-building process: vocational training and basic research-extension under the Secretariat of Agriculture-Texas A&M University program from 1965 to 1973; specialized undergraduate training and policy research subsidies under PPA I and II from 1975 to 1979; and development of graduate training and advanced research capabilities through the Agricultural Sector Training project from 1983 to 1990.

2. Overseas professional training has been a key element of each stage: 47 of ISA's faculty and vocation school graduates were sent abroad for undergraduate training, mostly to Texas A&M during the 1965-1973 period; 20 received post-baccalaureate and

graduate degree training subsidized by PPA from 1975 to 1979, and several are currently abroad under the auspices of the A.I.D. Agricultural Sector Training project. ISA has been awarded a greater proportion of the scholarships than its competitors; the Institute's superior scholastic reputation is the universally accepted reason.

3. ISA has received proportionally greater material and infrastructural support than the other Dominican agricultural schools from these Secretariat of Agriculture-administered, A.I.D. agricultural sector programs. ISA's location far from the political turmoil of the 1965 revolution was an important initial advantage; wise management and sound academic planning later enabled ISA to maintain its competitive edge.

4. The year 1975 signaled a turning point in Secretariat of Agriculture-university relations. Up to that time, agricultural training and research programs were developed separately by each agricultural school with little concern for avoiding redundancies or filling gaps in coverage. PPA mandated the creation of the Inter-University Committee to establish modes of cooperation between the Secretariat and the universities. The Secretariat of Agriculture established the Office of University Coordination to implement cooperative Secretariat-university projects, develop and coordinate agricultural research, sponsor workshops, support faculty and student training, and subsidize publication of research findings.

5. Beginning in 1976, the Secretariat of Agriculture provided the Dominican agricultural schools with the services of the Office of University Coordination and with A.I.D. resources to develop a series of specialized undergraduate study programs: the Autonomous University of Santo Domingo specialized in agronomy, Pedro Henriquez Urena University in agricultural education, and ISA-UCMM in technology-related areas. This was a significant step in avoiding the creation of duplicate programs.

6. The need for trained agricultural professionals has outstripped the Dominican Republic's manpower pool. A.I.D.'s Agricultural Sector Training project provides these schools with resources to help meet anticipated future demand. The Secretariat of Agriculture continues to actively contribute to this effort through the Inter-University Committee and by planning graduate study programs, monitoring changing manpower needs, and coordinating advanced training abroad.

APPENDIX D

ISA'S PARTICIPATION IN PLAN SIERRA

by

Gustavo Antonini

1. BACKGROUND

Plan Sierra originated as a local response to the problems of rural poverty and land degradation in the Dominican steeplands. This response reflected fundamental changes in attitudes that were occurring during the 1970s as traditional policies toward the production of a few commercial export commodities were deemphasized. New policies were formulated to lessen dependence on costly fossil fuel and food imports and to incorporate isolated small farmers into the national economic stream (ONAPLAN 1971). Major paths to realizing these policies appeared to be the utilization of the country's hydraulic resources and the diversification of the agricultural base. Plans included multipurpose river basin development programs, such as the Tavera project on the Yaque del Norte River, a US\$12.3 million investment and cornerstone of national economic growth (Balaguer 1973).

Tavera's catchment area was a mountainous region peopled by subsistence farmers and smallholder agriculturalists. Major problems in this area included poverty and disinvestments in the resources of production (Sharpe 1974). A worsening resource/population ratio was manifested in declining soil fertility and farm yields, deforestation, and siltation of the Tavera reservoir. Conflicting conditions existed for development: increased demand for irrigation water downstream from Santiago required that sedimentation and erosion be controlled; population pressures on limited resources in the Sierra upstream from Tavera were subjecting lands to slash-and-burn farming and extensive grazing (Antonini, Ewel, and Tupper 1975).

2. ISA'S ROLE IN THE ORIGINS OF PLAN SIERRA

Increasing national awareness of deforestation and soil erosion in the Dominican steeplands merged with a concern for the subsistence farmers of the Sierra by the Bishop of Santiago, Mons. Roque Adames. A native Serrano, Bishop Adames believed that a programmatic response was necessary to help the Sierra overcome these difficulties. He approached the Superior Institute of Agriculture (ISA) and the Madre y Maestra Catholic University (UCMM) with the idea of preparing a development plan. The idea was enthusiastically supported by the faculty, given their concern with the problems of rural poverty and land degradation in the region.

Luis Crouch, a member of the ISA and UCMM governing boards, endorsed the concept of a cooperative relationship between educational institutions and Government agencies to carry out rural development, because it would make ISA and UCMM more responsive to the needs of Dominican society (Crouch 1976). Crouch believed, however, changes in content and perspective would be needed in curriculum and policy development.

The proposed participation of ISA and UCMM would require a shift from the theoretical to the applied and practical side of transmitting skills and knowledge. With little experience in the application of problem-solving skills and no proven formula outlining how such a shift could be made, it would be necessary for ISA and UCMM to actively pursue in-service training, applied research, and outreach activities, thereby learning from practical, local experiences what curriculum and other program revisions would have to be made (Antonini 1978). Crouch believed that preparation of the proposed development plan would provide ISA and UCMM with a mechanism enabling them to institute the necessary substantive changes in curriculum design and program focus. He assumed a leadership role in marshalling the human and financial resources needed by ISA to prepare the plan.

Crouch arranged for Dominican agriculturalists and foreign scientists experienced in the region to conduct a 1-week field reconnaissance to identify the major problems affecting the Sierra. The reconnaissance provided a basis for public debate on the future of the region through an ISA-sponsored workshop (Quezada 1977a). The workshop provided the impetus for the Government's decision to charge ISA with drafting the development plan.

Funds from the Secretariat of Agriculture and the Rockefeller Foundation were made available, and ISA appointed a task force in early 1977, headed by Norberto Quezada, to gather baseline information and prepare plan guidelines. This group of ISA and UCMM faculty worked throughout the spring and submitted a draft to the Secretariat in July 1977 (Quezada et al. 1977).

The proposal contained two innovative elements: (1) a decentralized administrative structure to facilitate project implementation and (2) participation by ISA and UCMM in teacher training, provision of health and social services, and baseline agrosocioeconomic and ecological research. ISA's draft of the plan, revised by the Secretariat of Agriculture but retaining these two unique aspects, was adopted by the Dominican Government (SEA 1978).

ISA's role in the development of Plan Sierra was enhanced by several factors. The Northern Agricultural Development Center (CENDA), the agricultural research and extension station of the Secretariat of Agriculture, provided local expertise on a wide range of farm and rural community development subjects. Dominican agriculturalists and United Nations/Food and Agriculture Organization specialists at CENDA were carrying out several rural development projects, such as the farm diversification and production program for the Cibao Valley. Finally, an opportunity was presented for joint collaboration with the Dominican Government through an A.I.D. loan program to foster agricultural development and diversification of the small and medium-size farm sectors (A.I.D. 1974).

Plan Sierra became a reality as a result of the personal

commitments of Bishop Roque Adames and Luis Crouch and because of the unique institutional resources that were available in Santiago at that time. Although there were educational institutions elsewhere in the country, the base was especially strong in Santiago, the urban service center for the Cibao Valley agricultural region. ISA, UCMM, and the newly established Santiago Technological University were located here. ISA had the strongest vocational secondary school program in the republic, and it also offered a university-level agricultural engineering degree. UCMM offered programs in health, education, and the social sciences.

The Sierra was a stronghold of the reformist political party, and President Balaguer, as party leader, approved the plan and pledged financing during the 1978 electoral campaign. Balaguer lost the election but the new President, also a native of Santiago, was a founding member of the Santiago Development Association (SDA), and he vigorously reaffirmed the Government's support. Plan Sierra, as a division within the Secretariat of Agriculture, became a reality in February 1979 (El Sol 1979) and was incorporated as an autonomous public agency in December 1983.

3. IMPLEMENTATION RECORD

The Plan Sierra projects implemented over the past 7 years have been directed toward two objectives: to reduce soil erosion and to improve the quality of life. The Plan's original focus on agricultural and livestock production was deemphasized after fieldwork indicated the long-term, pervasive effects of land degradation both within the region and on downstream hydroelectric facilities (Rocheleau 1984). As a result, projects were developed in reforestation, revitalization of coffee farms, and social services, in keeping with a new vision of the Sierra as a renewable source of water, forest products, and coffee.

ISA was directly involved in several of these efforts. Faculty conducted research on the introduction of new forest species and varieties of permanent tree crops, such as aguacate, macadamia, grapes, tea, and fruits. With support from the National Energy Policy Commission, ISA carried out experiments on fuelwood alternatives and established a model farm to test forage grasses and agroforestry systems (de Janvry and Hecht 1984).

Beyond these endeavors, the role and impact of ISA have been much less than anticipated. Plan Sierra originally considered ISA's participation in a program that combined training at the professional, subprofessional, and farm-operator levels with applied research and community outreach (Antonini and York 1979). Because ISA offered training programs in agriculture -- and UCMM in health, education, and the social sciences -- within commuting distance of Plan Sierra project sites, it was reasoned that a close working relationship could evolve. It was anticipated that this relationship would afford faculty and students an opportunity to work daily in target rural communities

through structured field exercises as part of regular class assignments, in field-based short courses, or through special in-service training. Plan Sierra developed a community health program in close collaboration with UCMM, but ISA's participation has been less than anticipated.

Several factors have served to greatly reduce ISA's participation in the Plan Sierra. First, agronomic fieldwork is tied to crop calendars and planting and harvesting cycles, schedules that conflict with ISA's academic calendar. Second, there was a lack of adequate transportation and field maintenance for faculty and students. Third, ISA faculty have not been given recognition for the additional work entailed in collaborative teaching, research, and outreach. Finally, there is a substantive difference between the focus of ISA's training on lowland commercial agricultural systems and the Plan's orientation toward the marginal steepplands, with needs for training and research in natural resource management and farming systems research/extension (de Janvry and Hecht 1984).

In summary, while ISA faculty have successfully undertaken some research for Plan Sierra, the institutional linkage between ISA and Plan Sierra has been poor, particularly in training and outreach. ISA and Plan Sierra leaders recognize that the programs of both institutions would be strengthened by future collaboration. Closer cooperation may occur in the near future, as the Kellogg Foundation recently awarded US\$734,851 to Plan Sierra for 2-year programs in food production and nutrition (US\$642,810) and social forestry (US\$92,041). An education component in the first project specifies participation by 120 ISA students during 2 months each year in short courses in community and farm-level issues, small-farm production systems, steeppland agriculture, and the sociocultural farm environment. Funds are available to cover student costs in farm management (US\$12,000) and general field maintenance (US\$40,000) (Plan Sierra 1985). Transportation can be made available by Plan Sierra.

APPENDIX E

ISA AND THE FUELWOOD PROGRAM

by

Gustavo Antonini

1. BACKGROUND

The urban and rural poor of the Dominican Republic share with other developing countries an overwhelming dependence on wood as the main or only source of energy. As population increases, this dependence on wood leads to pressures on forest resources.

In the Dominican Republic, the increased need for fuelwood

is the result of a worsening population/resource equation. Wood consumption for fuel was 2.47 million cubic meters (m³) in 1980 (Hartshorn et al. 1981). More wood will be needed for firewood and charcoal according to forecasts of demographic growth and accelerated urbanization, which all result in higher consumption rates of wood for energy: 3.416 million m³ in 1990 and 4.307 million m³ by the year 2000 (Olsen et al. 1984).

Most firewood and charcoal is produced from dry forest and thorn woodlands. One estimate is that the 5,905 square kilometers of dry forest in the republic contain 3.74 million m³ of wood, with an annual growth rate of 1.7 million m³ (Jennings and Ferreiras 1979). How long the Dominican Republic can continue to meet its fuelwood needs is unclear. What is certain is that as forest and woodland are cleared for agriculture and fuelwood, and as land pressure forces shifting cultivators onto marginal steepplands, irreversible land degradation becomes increasingly probable. A Government priority is to find ways to prevent this.

Among the ways to slow the abusive cutting of forests for fuelwood are to improve the management and utilization of natural forests and to establish plantations of fast-growing species of high calorific value. Rational forest management over the long run can stabilize the foundations of the Dominican Republic's food and fuelwood production systems and help stop the impoverishment of the natural environment.

The Dominican Government has linked development of renewable energy resources to nonrenewable resource management, and in 1979 it established a National Energy Policy Commission (COENER) to plan and coordinate strategies for energy production and consumption. The Commission completed a national energy assessment with A.I.D. grant funding in the fall of 1980. This assessment laid the groundwork for a 5-year US\$22.2 million Energy Conservation and Resource Development Project. The project, with US\$15.9 million from A.I.D. and US\$6.3 million from the Dominican Government, started in 1983. An integral component of this comprehensive energy project was the development of an institutional capacity at the Superior Institute of Agriculture (ISA) to exploit wood as an alternative source of energy.

2. ISA'S ROLE IN PROBLEM IDENTIFICATION AND PROJECT DEVELOPMENT

ISA has given priority attention to resource management needs over the past 10 years. This attention reflects the personal conviction of ISA board members Victor Espaillet and Luis Crouch regarding the long-term consequences of resource degradation and the need to prepare cadres of professionally qualified Dominicans to deal with energy resource problems. Victor Espaillet's concern grows out of the pioneering efforts of his conservationist father-in-law, Ing. Jose Luna (Luna 1984). Luis Crouch's concern draws from Plan Sierra experiences and the

work of ISA adviser Rudolph Graw, at the University of California, Davis.

ISA began offering a university-level forest resources management concentration in 1976. Two faculty members were sent abroad for graduate training in forestry, and several students have graduated as agricultural engineers with a forestry specialization over the past 10 years. Both faculty graduate theses and senior student research reports dealing with management (Montero 1979) and fuelwood attest to a growing body of knowledge on energy conservation and resource development in the Dominican Republic.

Penelope Jennings, a University of California, Davis-trained forester and Peace Corps volunteer, came to ISA in 1977 to assist in teaching the forestry courses. With ISA faculty and student assistance, she also carried out a baseline fuelwood energy resources survey of the republic's dry forest and thorn woodlands (Jennings and Ferreiras 1979). This study provides the only national supply and demand estimates of fuelwood production and consumption available to date.

In addition to its core training and research programs, ISA has provided leadership in formulating national and regional energy policies. The Institute co-hosted with Madre y Maestra Catholic University (UCMM) a Caribbean consultation on energy and agriculture that identified strategies for interregional cooperation between Government and universities in such areas as physical and biological energy sources, energy technologies for small-scale agriculture, and national energy policy (Quezada and Reyna 1980). ISA forestry faculty also have staffed professional positions on COENER and have assisted in designing the Wood Fuel Development Program of the A.I.D./Dominican Government-sponsored COENER project.

3. THE COENER PROJECT

The US\$22.2 million COENER Energy Conservation and Resource Development project focuses on helping reduce Dominican dependence on imported petroleum by increasing the availability of affordable energy to all income groups in the country. COENER implements the project through a series of programs in national energy planning, industrial conservation, mini-hydro development, fuelwood development, and technical assistance, in collaboration with ISA, the Dominican Institute of Industrial Technology (INDOTEC), the Dominican Electricity Corporation (CDE), the Dominican Institute of Water Resources (INDRHI), and the Central Bank.

ISA's US\$2.1 million Fuelwood Development Program under this project attempts to address a major bottleneck to wider utilization of local energy resources, namely the lack of information about the economic, technical, and social feasibility of renewable energy technologies within the Dominican Republic. The program focuses on pilot studies to test and demonstrate the

most appropriate tree species for energy purposes and the most efficient technologies for converting wood to various energy uses. ISA's objective is to provide the information needed to implement large-scale efforts in fuelwood production and utilization, either through energy farms or small-scale tree production -- or possibly both.

The program was initiated in July 1983 when Purdue University signed an agreement to provide ISA with technical assistance in tree research, wood conversion, and participant training. ISA received its initial disbursement in January 1984.

The Dominican private sector has played an important role in the program's implementation by providing land, field workers, supplies, and materials. The program's base of operations is near the town of Mao, west of Santiago city, on a 1,000-hectare parcel of donated land. The first pilot plantation was established there in September 1983.

The program's technical staff is headed by a graduate-trained forester on the ISA faculty. Purdue University provides a full-time adviser. The program's staff draws from technical personnel assigned to it by COENER, the Secretariat of Agriculture, and the Dominican National Forest Service (FORESTA). There are full-time volunteers from the Peace Corps and from a German volunteer organization. Short-term consultants have been assigned periodically from the Federal University of Vicosa in Brazil.

The list of Dominican, U.S., and international institutions collaborating with ISA on this program is impressive. The Inter-American Institute of Agricultural Cooperation (IICA) assists with baseline studies and the Center for Tropical Agricultural Research and Training (CATIE) in Costa Rica provides seeds, technical assistance, and training. Ohio State University, through a separately funded research project, is measuring and inventorying dry subtropical woodland species.

At the national level, Plan Sierra and the Secretariat of Agriculture provide seedlings, field workers, and tree planting areas for research and extension. Financiera Popular, a private Dominican banking firm, offers funds and technical staff to carry out economic analyses. The Dominican Agrarian Reform Institute (IAD) provides plants for field trials.

Two major research and extension efforts form the body of ISA's Fuelwood Development Program. One component focuses on biomass production for firewood and charcoal from plantation and secondary forests. While field experiments cover a wide range of ecological and edaphic conditions, major emphasis is given to the dry subtropical forest because this has the greatest fuelwood potential. By the end of this 5-year research program, reliable information should be available for making decisions about what type of trees to plant under different soil and climate conditions and how to plant and grow the seedlings.

The second component is a wood conversion program. It is

designed to test and demonstrate improved technologies for converting wood to charcoal and to train a limited number of Dominicans in the application of these technologies in preparation for a wide-scale promotion effort.

Both plantation and forest operations are based at the program's 1,000-hectare site at Mao. The ISA campus west of Santiago provides access to a transitional forest for additional experimentation and facilitates the incorporation of student instruction and research into the program. Another 15 field sites are situated throughout the republic.

4. IMPACTS AND OUTPUTS

The Fuelwood Development Program's outputs and its impacts on the firewood and charcoal industry can be evaluated on the basis of published research findings and training completed since the program began in January 1984. The program publishes research findings as interim Technical Notes and more complete Technical Bulletins. Sixteen Technical Notes were published in 1984 and 1985; another eight will be published in 1986. Technical seminars and short courses have been offered or are planned in tree research methodologies, forest plantation management, seed cultivation and handling, charcoal making, and forestry data gathering.

The program calls for long- and short-term overseas training of approximately 16 Dominicans and includes 1 year of graduate study for a master's degree with emphasis on plantation management for four Dominicans.

APPENDIX F

ISA'S CURRICULUM

by

Fernando del Rio and Richard H. Merritt

The Superior Institute of Agriculture (ISA) was founded in 1962; in 1964 the vocational secondary-level program admitted its first students. In 1968 a program leading to a B.S. (I.A.) in agriculture was begun jointly with Madre y Maestra Catholic University (UCMM). This program comprised three concentrations: (1) agricultural mechanization, (2) agricultural education, and (3) administration of agricultural enterprises. In 1976 six more concentrations were added: (1) agricultural economics, (2) horticulture, (3) irrigation and drainage systems, (4) forestry, (5) food technology, and (6) land reform.

Enrollment in ISA's college-level program has declined as a result of the increase in the number of "local" colleges offering

agricultural instruction. Thus, because of low demand, in 1986 ISA's nine degree concentrations were reduced to five: (1) administration of agricultural enterprises, (2) horticulture, (3) forestry resources management, (4) irrigation systems, and (5) animal production.

ISA is planning to request approval to offer a master's degree in forest resources and later, agribusiness management and rural development. ISA is also planning to discontinue its secondary program and replace it with a 3-year practical agriculture associate-level program.

ISA's curriculum is heavily theoretical, with the practical aspects limited to laboratories related to theory and visits to farms rather than field study. The horticulture program probably provides the most hands-on experience.

The secondary school program provides more practical experience than does the collegiate program, although the major emphasis is also on theory. The practical agriculture course gives students experience in agricultural production, but it is not well coordinated with classroom experiences.

There is unanimous agreement among faculty members and students that the I.A. degree curriculum should contain more practice, mainly in the field. Even though most professors include visits to farmers and agricultural enterprises as part of their courses, these visits are mostly observational and do not involve any dynamic and practical student participation. Likewise, most laboratory work supports the theoretical content of the courses.

The issue of theory versus practice was characterized by one of the students interviewed as "teaching how to drive a tractor without the tractor." This statement should not be construed as a rejection of the plan of study, however. Students interviewed had praise for the courses -- the variety and content -- included in their concentrations. None of them suggested the elimination of any course.

In most cases, the lecture method is the most commonly used pedagogical technique. The case study approach developed by the Center for Rural Development Administration (CADER) has been used in the agribusiness program but is not much used in other ISA courses.

Research is carried out by students for their thesis. There is unanimous consensus among professors and students that the thesis constitutes one of the most useful learning experiences of the curriculum. It is divided into two phases. The first report outlines the proposal to be developed, including the description of the problem, the formulation of the hypothesis, and the identification of the research methods to be followed. The second report details the outcome of the research, including data tabulation, analysis, and recommendations.

The library consists of 20,000 volumes; 5,000 journals, bulletins, and reviews; and 16,000 miscellaneous publications. The library is not used extensively by either professors or students, probably because much of the material is out of date. The library has not been able to keep its collection current because of a lack of funding.

APPENDIX G

ISA'S FINANCIAL BASE

by

John Strasma

Initial funding for the Superior Institute of Agriculture (ISA) came from wealthy families and business firms of the Santiago region through the Santiago Development Association (SDA) and from eager donor organizations that flocked to the Dominican Republic after the assassination of the dictator Trujillo opened an opportunity to establish an effective democracy strategically located between Puerto Rico and Haiti and Cuba.

Early reports during the years when ISA was essentially a vocational agricultural boarding school under strong leadership from Texas A&M University do not indicate much financial stress. For that matter, the country's finances were in fairly good shape as well, at least when most of the exportable sugar could be sold in the United States at prices well above world market levels.

As the secondary school matured and SDA leaders realized that both they and donor organizations thought there was now a need for training at the university level as well, ISA joined forces with Madre y Maestra Catholic University (UCMM) in Santiago to provide that training. In essence, ISA agreed to teach all the technical courses, from plant and animal sciences to agricultural economics, whereas UCMM agreed to teach mathematics, ethics, religion, philosophy, physical education, and other general courses. UCMM would handle all details of matriculation and would collect tuition, dividing it with ISA more or less in proportion to the hours taught by each party.

1. GOVERNMENT FUNDING

Since 1963, a major part of ISA's revenue has been a yearly resource transfer of RD\$50,000 from the Secretariat of Education. This commitment was part of the original tripartite agreement between the Dominican Government, A.I.D., and the SDA.

For many years, the Dominican peso was at par with the U.S. dollar, and this Government contribution was basically enough to keep ISA going without undue financial stress. However, for the last several years the exchange rate has been about 3 pesos per U.S. dollar. As a result, the Secretariat of Education's contribution does not go as far as it used to. In turn, this has been the main reason given by SDA members for the failure to raise the salaries of ISA staff to keep pace with inflation over the period since 1963.

During the last 3 or 4 years, the Dominican Republic has been under great economic stress, both in the public and private sectors. The overvalued peso made it hard to export anything -- even sugar -- and cover rising domestic production costs. At the same time, the overvalued peso made it attractive to import almost anything. The resulting trade gap was covered through increased borrowing from abroad, but for the last several years the large foreign banks have no longer been willing to increase their lending to third world governments.

Public finances were no better, as successive governments committed themselves to current and capital spending far beyond their resources, and external grants and loans were not forthcoming to cover the gap. Inevitably, the Government was forced to turn to the International Monetary Fund (IMF) to devalue and begin to modify costly subsidies of basic foods, mass transportation, and many other programs.

The overcommitment by the public sector caused much distress for ISA and other institutions. Their subsidies, although usually not ended, were not adjusted for inflation. The institutions compensated for the reduced value of the subsidies mainly by not raising staff salaries, but that neither solved all the institutional problems nor satisfied the staff.

The overcommitment of the public sector was also manifested in the failure to disburse budgeted amounts on schedule, which caused serious problems for ISA and similar private sector institutions receiving substantial amounts of public funds. One ISA director said that much of his time went into fruitless political efforts merely to get the money already budgeted for ISA. As the promised Government check failed to appear on time, ISA's payrolls and checks to suppliers were sometimes several days or even weeks late.

A.I.D. too was sometimes part of the problem rather than the solution. In 1986, both before the presidential elections of May and during the 3-month transition before the new government took office, the Dominican Government had been eager to disburse funds. Understandings with external organizations such as the IMF no longer seemed to be a problem. However, each disbursement also requires approval from A.I.D. and that approval was delayed by months -- in the case of the postgraduate management program at ISA, from January to October.

The tardy receipt of budgeted funds played havoc with the

programs of the institutions, including ISA. Even so, ISA staff seem surprisingly understanding of delays in disbursement by their own Government or by A.I.D. They merely express hope that future project evaluations will take proper account of the fact that planned programs had to be cut back drastically when the funds did not arrive as scheduled.

2. DONOR FUNDING

ISA and the SDA leadership have also been sensitive to changing interests on the part of donors. They realized that donor staff are always more interested in funding support to develop "new" ideas than in continuing the funding of projects begun by their predecessors. Thus, once the ISA/UCMM collaboration was turning out high-quality graduates, A.I.D. and foundation interest in undergraduate agricultural science teaching waned. ISA and the SDA came in with a proposal for a postgraduate program in agricultural sector management, which was funded by A.I.D. and the Kellogg Foundation.

The postgraduate program at the Center for Rural Development Administration (CADER) has brought added stress to ISA. Although part of ISA, the program had to pay higher salaries than those paid to the secondary and university teaching staff at ISA because of high private and public sector demand for persons with the necessary qualifications to staff the graduate program. Every effort to arrange for higher stipends for this small, new, and relatively young (although highly trained) part of the ISA staff has led to hard feelings and the departure of some ISA staff. In turn, each failure to establish higher salaries has led to the departure of some of the postgraduate management staff.

ISA's leadership, and that of the SDA, has not yet reached a broadly acceptable solution on the salary issue. A measure of salary differentiation was reluctantly accepted by the ISA board as a condition precedent to A.I.D. renewal of funding for new features of the postgraduate program. However, many ISA staff both in and outside CADER have stated that salary differentials are still a divisive issue.

3. CURRENT SITUATION AND OUTLOOK

Although often regarded by its competitors as "rich," ISA's principal wealth lies in the performance of its graduates and its very talented staff and board members. As the account above attempts to make clear, it has had its share of financial problems.

The recent A.I.D. agreement to fund new aspects of the CADER program contains a proposal that ISA try to obtain endowment

gifts. If ISA succeeds in raising RD\$1 million in endowments, additional PL 480 monies of RD\$1.5 million would be turned over to help endow a total of ten "chairs" at ISA. Thus far, no one has taken the leadership in seeking such donations, and ISA staff clearly regards this as properly a function of the board of directors.

APPENDIX H

CADER: AN OUTREACH PUBLIC SERVICE PROGRAM

by

John Strasma

1. ORIGINS AND PURPOSE

The Center for Rural Development Administration (CADER) was conceived at the Superior Institute of Agriculture (ISA) in 1980 and officially commenced operations in 1982. In 4 years, it has provided intensive short courses for hundreds of executives and mid-level administrators from public sector agricultural institutions.

The first seed monies for CADER were provided in 1980 by the Kellogg Foundation. The Foundation attempts to enhance outreach programs at Latin American universities generally, and particularly those that involve students in community problemsolving and rural development. ISA and the Kellogg Foundation agreed that the Central American Institute for Business Administration (INCAE) model in Nicaragua was worth imitating. Case studies are the basis for CADER's activities, and CADER analyzes Dominican rural development problems and formulates policy options based on them. Most of the Kellogg grant was used for technical assistance, building construction, and postgraduate training of staff in the United States.

In support of CADER, A.I.D. financed the Rural Development Management project (517-0125), which was approved in 1983. The project was "designed to establish an in-country institutional capability to upgrade the management skills of public and private sector managers working in the area of rural development, through policy seminars and management courses utilizing the case study method." Almost all of the participants in CADER's seminars and training programs in the first several years were public sector agency technicians, managers, and decision-makers.

A 2-year project extension was approved December 31, 1985. It provided an additional US\$500,000 "to expand the services to the private sector and consolidate services to the public sector." The extension was intended to enable CADER to provide training courses for agribusiness managers and to provide management consulting and information services to the private sector for fees That were to help ensure CADER's future financial

viability. Specifically, the extension was to

(1) increase and extend CADER's services in support of private sector growth in agriculture and agribusiness as an educational institution that provides in-service training of managers, consulting, and policy seminars for agricultural organizations; (2) enable CADER to provide these services on a sustained basis by supporting its institutional stability, as indicated by a well-trained core faculty with a career commitment to CADER, a pool of instructor-practitioners in the private and public sectors, an Information Center that services CADER's instructional and consulting programs and clients as well as the agricultural sector in general; ... (3) to increase the Center's financial self-sufficiency and stability.

CADER was originally created to respond to perceived deficiencies at the management, and technical staff level, but well above the level of employees trained in the vocational program. Trainees were assumed to hold a university degree in agriculture or at least some university training plus experience. They were expected to already hold jobs in the public or private sector, from which they would be released, with pay, to attend seminars or courses lasting from 1 day to a maximum of 5 weeks.

In practice, most of the early programs trained public sector mid-level staff, section chiefs, and others in similar positions. The private sector benefited by hiring these people, preferably after they had been seasoned by several years of poorly paid experience in the public sector and by participating in several CADER courses and seminars while on the public payroll.

It was assumed that the quality of CADER's courses would convince private employers to temporarily release their employees to attend these courses. Thus far, however, employers have shown much greater willingness to allow their employees to attend short workshops and seminars than to attend the 5-week course. Employers prefer to hire people after they have taken the 5-week course while on the public payroll, rather than release their current employees to attend it.

An example of the new offerings to the private sector is CADER's use of several IBM model 30s to give practical training in the use of microcomputers to private sector employees in the Santiago urban and rural areas. USAID has supplied the computers.

Other short courses will tackle joint ventures, financing for new products, export marketing requirements for agribusinesses that want to exploit the U.S. market, and the planning and organization of farm production, processing, and marketing. Outgrower contract mechanisms will be taught, for example, to the managerial employees of agribusiness firms that want to use this method of obtaining materials.

Even the courses aimed at public sector agencies will have a private sector orientation to help land reform and other public sector technicians and managers grasp the principles of efficient private sector operations for the lands they control. These courses will also probably facilitate efforts to enter into joint ventures between Dominican private sector investors and the beneficiaries of land reform activities.

Eventually, CADER and ISA aspire to offer a 5-month management course, several of which over a period of years would lead to an M.B.A. degree.

2. CADER'S IMPACT ON RURAL DEVELOPMENT

A major example of CADER's contribution to rural development is the research and subsequent CADER conference on agrarian reform. It led to a new law on profit-sharing on collective land holdings according to the relative productivity of individual members on the parcels assigned to each of them. The previous law required that profits be shared in proportion to hours worked, rather than according to the actual production obtained from each beneficiary's parcel.

The campesinos on one agrarian reform project established the new profit-sharing arrangement themselves, behind the backs of land reform functionaries. CADER discovered it through its research efforts and found that it was working much better than the more egalitarian scheme. CADER then invited key legislators from both major parties, as well as land reform agency officials, to a CADER seminar based on these case studies.

Campesino leaders from the innovative project also attended and participated in the seminar, explaining graphically the advantages of the system, which is in many respects similar to the "Responsibility System" recently adopted in the People's Republic of China. The legislators quickly concluded that the campesinos should be allowed to organize their production in this way if they wished, and changed the law accordingly.

With their new freedom, the campesinos also created informal but effective mechanisms by which any land reform beneficiary who does not repay his production credit is "helped" during a second year. If he still fails to repay his debts, he is replaced by another eligible campesino.

Neither the land reform agency nor the agricultural bank had previously been able to deal with beneficiaries who could not or would not use their land productively and repay their loans. Land reform laws do not allow the eviction of a beneficiary for sloth or nonrepayment. However, in the new arrangement the credit comes through a service cooperative owned by all the beneficiaries in a project. The cooperative is responsible for repaying the bank every year. If one member does not repay, the

rest have to make up his debt.

CADER's research indicated that the campesinos had developed informal but effective ways to pressure those who were not contributing their share to the loan repayment. Even though there is no legal basis for eviction, they are in fact quite able to replace unproductive members, and they do. CADER's research showed that the land reform program worked better as a bottom-up program than as one directed by functionaries of the central Government. ISA and CADER had access to the actual decision-makers in Dominican politics. Hence they were able to raise these issues at a high level of government where policies could be, and were, changed.

3. THE FUTURE OF CADER

CADER was designed and initiated as a separate unit of ISA. However, until recently ISA's director has maintained control over its operation. This has created problems among the directorate and staff of CADER, who would like to be more independent of direct ISA management. CADER has had difficulty retaining its staff after they receive graduate training outside the Dominican Republic. This problem results from ISA's inability to pay them wages that are competitive with those offered by the private sector to individuals with similar levels of graduate training in business management areas. These problems will have to be addressed within the total context of ISA if they are to be solved. Attention will have to be given to decentralization of decision-making processes related to program planning and resource allocation. Additionally, ways will have to be found to improve staff salaries.

It was the intent of Luis Crouch and other architects of CADER to have the case study method adopted by other units of ISA as a formal training tool. This has not occurred. In part, this reflects the lack of integration of CADER into ISA's overall program. In the long run, the success of both ISA's and CADER's programs will depend on how well CADER's roles and functions become integrated into ISA's overall academic program.

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